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ABSTRACT

This program guide identifies primary concerns in the organization, operation, and evaluation of an automotive service technology program. It is designed for local school district and community college administrators, instructors, program advisory committees, and regional coordinating councils. The guide begins with the Dictionary of Occupational Titles occupational description. A section on program content presents the curriculum framework that contains major concepts/content, laboratory activities, special note, and intended outcomes and the student performance standards that are divided into the outcomes shown in the curriculum framework. The section on program implementation addresses the following: teacher characteristics, conventional instructional methods, student admissions criteria, student placement, cooperative education, and student organization participation. An instructional resources section lists suggested resources organized by outcome. The section on setting up classroom and laboratory facilities covers facility design recommendations and safety, maintenance, and liability. The next section lists equipment items by outcome. The last section discusses teacher technical updating and teacher standards. A list of professional organizations and support services follows. A Career Merit Achievement Plan (Career MAP) is attached. It displays the competencies required for entry into the field of automotive service technology and documents the student's level of achievement. (KC)

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FLORIDA VOCATIONAL PROGRAM GUIDE FOR

AUTOMOTIVE SERVICE TECHNOLOGY

Prepared by

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INTRODUCTION

Vocational education meets the needs of students desiring to pursue a selected vocation and is designed to provide training that is realistic in meeting present and future employment opportunities. In recent years, applications of science and technology have expanded rapidly, increasing the education and training required of workers. This has made vocational training programs more attractive as an educational option. The new technologies require well-trained workers to carry out both standardized and specialized procedures, and whose training foundation has given them the capacity to keep pace with continuing technology demands.

The Florida Department of Education shares with business and industry the determination to provide opportunities for upward mobility to as many Floridians as possible. Vocational training programs can keep pace with the demands of new industrial patterns and can provide the opportunity for many of our citizens to gain financial stability and an improved sense of self worth. Therefore, it is necessary to create exemplary vocational programs and to make those programs consistent throughout the state.

This Program Guide identifies primary concerns that should be considered in the organization, operation and evaluation of a vocational education program. It has been developed to provide useful information to local school district and community college administrators, instructors, program advisory committees, regional coordinating councils and others charged with the responsibility of offering vocational education programs.

OCCUPATIONAL DESCRIPTION

A principle occupational title is identified for each vocational training program. This title is validated by the United States Department of Labor Dictionary of Occupational Titles (DOT) or other appropriate references. Such references may be the United States Department of Commerce Standard Occupational Classification Manual (SOC), the Occupational Employment Statistics Survey Dictionary (OES), or Vocational Preparation and Occupations (VPO) prepared by the National and State Occupational Information Coordinating Committees. Information obtained from industry advisory committees may also be used to validate the principle occupational title. The job title and code number for this program are listed in the curriculum framework which accompanies this guide.

The United States Department of Labor Dictionary of Occupational Titles (D.O.T.) identifies the job title for this occupational area as follows:

D.O.T. JOB TITLE	D.O.T. CODE
Automobile Mechanic Supervisor	620.131-014
Automobile Repair Service Estimator	620.261-018
Engine Repair Specialist	620.261-010
Transmission and Rear Axle Specialist	620.281-062
Automotive Electronics Specialist	828.281-010

The definition (description) for this job title is taken from the D.O.T. for easy reference.

620.131-014 AUTOMOBILE MECHANIC SUPERVISOR.

Supervises and coordinates activities of automobile mechanics engaged in repairing, adjusting, servicing and storing motor vehicles in industrial or commercial establishment. Analyzes defective equipment to determine cause of trouble. Inspects and drives repaired vehicles to verify repairs. Trains workers in and demonstrates repair and maintenance of vehicles, using handtools, welding and grinding equipment. Evaluates performance of workers. Keeps inventory of repair parts and equipment and requisitions replacement stock. Prepares repair reports and vehicle requests. Schedules transporting of passengers or materials to service or storage areas. May supervise workers engaged in inspection and repair of miscellaneous equipment, such as cement mixers and electric trucks. Performs other duties as described under SUPERVISOR.

620.261-018 AUTOMOBILE REPAIR SERVICE ESTIMATOR.

Inspects and tests automobiles and trucks to determine need for and cost of repairs: Determines need for repairs by road test [AUTOMOBILE TESTER], by use of mechanical testing devices [BRAKE REPAIRER; FRONT-END MECHANIC], by questioning customer about vehicle's performance or by visual inspection of vehicle. Estimates cost of repair and prepares itemized work order, listing costs of parts and labor. May make minor adjustments or repairs, such as brake adjustment, battery cable replacement or hinge lubrication. May supervise AUTOMOBILE-BODY REPAIRER, AUTOMOBILE MECHANIC, PAINTER, AUTOMOTIVE and other garage workers. May be designated according to specialty as TRUCK-REPAIR-SERVICE ESTIMATOR.

620.261-010 ENGINE REPAIR SPECIALIST.

Repairs and overhauls automobiles, buses, trucks and other automotive vehicles: Examines vehicle and discusses with customer or AUTOMOTIVE-REPAIR-SERVICE ESTIMATOR, AUTOMOBILE TESTER or BUS INSPECTOR nature and extent of damage or malfunction. Plans work procedure, using charts, technical manuals and experience. Raises vehicle, using hydraulic jack or hoist, to gain access to mechanical units bolted to underside of vehicle. Removes unit, such as engine, transmission or differential, using wrenches and hoist. Disassembles unit and inspects parts for wear, using micrometers, calipers and thickness gauges. Repairs or replaces parts, such as pistons, rods, gears, valves and bearings, using mechanic's handtools. Overhauls or replaces carburetors, blowers, generators, distributors, starters and pumps. Rebuilds parts, such as crankshafts and cylinder blocks, using lathes, shapers, drill presses and welding equipment. Rewires ignition system, lights and instrument panel. Relines and adjusts brakes, alines front end, repairs or replaces shock absorbers and solders leaks in radiator. Mends damaged body and fenders by hammering out or filling in dents and welding broken parts. Replaces and adjusts headlights and installs and repairs accessories, such as radios, heaters, mirrors and windshield wipers. May be designated according to specialty as AUTOMOBILE MECHANIC, MOTOR; BUS MECHANIC; DIFFERENTIAL REPAIRER; ENGINE-REPAIR MECHANIC, BUS; FOREIGN-CAR MECHANIC; TRUCK MECHANIC. When working in service station may be designated AUTOMOBILE-SERVICE-STATION MECHANIC.

620.281-062 TRANSMISSION AND REAR AXLE SPECIALIST.

Repairs manual and automatic transmissions in automobiles, buses, trucks and other automotive vehicles: Raises automotive vehicle, using jacks or hoists, and removes transmission, using mechanic's handtools. Disassembles transmission unit and replaces broken or worn parts, such

as bands, gears, seals, and valves. Adjusts pumps, bands and gears as required, using wrenches. Installs repaired transmission and fills it with specified fluid. Adjusts operating linkage and tests operation on road. May adjust carburetor. May verify idle speed of motor, using equipment, such as tachometer, making required adjustments. May specialize in repair of automatic transmissions and be designated as AUTOMATIC-TRANSMISSION MECHANIC.

828.281-010 AUTOMOTIVE ELECTRONICS SPECIALIST.

Repairs electronic equipment, such as computers, industrial controls, radar systems, telemetering and missile control systems, transmitters, antennas and servomechanisms, following blueprints and manufacturers' specifications, and using handtools and test instruments: Tests faulty equipment and applies knowledge of functional operation of electronic units and systems to diagnose cause of malfunction. Tests electronic components and circuits to locate defects, using oscilloscopes, signal generators, ammeters and voltmeters. Replaces defective components and wiring and adjusts mechanical parts, using handtools and soldering iron. Alines, adjusts and calibrates equipment according to specifications. Calibrates testing instruments. Maintains records of repairs, calibrations and tests. May install equipment in industrial or military establishments and in aircraft and missiles. May operate equipment, such as communication equipment and missile control systems in ground and flight tests and be required to hold license from governmental agency May be designated according to type of equipment repaired as ELECTRONICS MECHANIC, COMPUTER.

PROGRAM CONTENT

The Division of Vocational, Adult, and Community Education, as required by State Board of Education (S.B.E.) **Rule 6A-6.0571**, publishes Vocational Education Program Courses Standards annually. This document specifies the minimum program content for the operation of a vocational training program for the occupational titles listed. Each program identified in the Florida Department of Education Course Code Directory is required to establish course standards. The standards for each vocational offering are comprised of two major components: (1) Curriculum Framework and (2) Student Performance Standards.

Curriculum Framework (CF)

The Curriculum Framework specifies the exact course title, course number, levels of instruction, major course content, laboratory activities, special notes, major course concepts and intended outcomes. The program requirements stipulated in the curriculum framework have been approved by the State Board of Education and are the legal bases for delivery of instruction.

Student Performance Standards (SPS)

The Student Performance Standards are a resource list of job-specific competencies. This list is generated and approved by industry experts and becomes the basis for curriculum development in vocational programs. Local school districts and community colleges must, by law, adopt student performance standards for their vocational programs. They may, at their discretion, adopt the list provided or develop their own as long as there is sufficient content to address each intended outcome. A program may provide instruction beyond the minimum specified in the SPS if desired. The decision to do this should be based on local industry needs. However, the minimum must be presented.

The SPS for secondary level programs contain a third component, course structure. This component specifies the number of courses required for program completion and the content of each course. The courses may be taught in any sequence, but the content may not be changed unless approved by the Division of Vocational, Adult, and Community Education.

The curriculum framework and student performance standards are intended for use as a guide, not a teaching tool. Teachers or curriculum development personnel are expected to develop or select complete curriculum materials for their training programs based on the curriculum framework and student performance standards. Each intended outcome and SPS should be thoroughly analyzed for related cognitive and procedural subskills. The curriculum framework and student performance standards are presented in the following pages.

PROGRAM CONTENT AUTOMOTIVE SERVICE TECHNOLOGY

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1989

PROGRAM TITLE: Automotive Service Technology

CODE NUMBER: Secondary _____ Postsecondary AER0991

Florida CIP IN15.080300

SECONDARY SCHOOL CREDITS __ COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): __ 7-9 __ 9-12 __ Postsecondary Adult Vocational

__X__ Postsecondary Vocational __X__ Other ____30, 31

CERTIFICATION COVERAGE: AUTO MECH 7 AUTO IND @ 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as automobile mechanic supervisors (620.131-014), automobile repair service estimators (620.261-018) engine repair specialists (620.261-010), transmission and rear axle specialists (620.281-062) and automotive electronics specialists (828.281-010). This program also provides supplemental training for persons previously or currently employed in these occupations.

The course content will include the following: instruction in diagnosis of malfunctions in the repair of engines, fuel, electrical, cooling and brake systems; drive train and suspension systems; radiators; transmissions and carburetors; basic management concepts; troubleshooting skills; and servicing, maintaining and repairing all mechanical systems or gasoline and diesel powered automobiles including fuel, electrical, cooling, brake, drive, suspension and related systems.

The course content should also include Principles of Work Environment Readiness (P.O.W.E.R.) skills training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: engine system performance; automotive accessories; and theory, fundamentals, service and rebuilding of engines, automatic and manual transmissions, drive trains, steering, suspension, brake and electrical systems.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Section 233.0695 F.S., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 1800 hours.

Student performance standards required for National Institute for Automotive Service Excellence (ASE) certification are identified with the initials ASE following the standard.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate an understanding of automotive mechanics.
02. Apply electrical and electronic skills in diagnosing/ troubleshooting malfunctions of electrical/electronic components.
03. Demonstrate proficiency in servicing steering, suspension and wheel systems.
04. Demonstrate proficiency in servicing automotive brake systems.
05. Demonstrate proficiency in servicing cooling, air conditioning and heating services.
06. Demonstrate proficiency in engine performance service.
07. Demonstrate proficiency in automatic transmission/trans-axle service.
08. Demonstrate proficiency in servicing manual drive trains and axles.
09. Demonstrate proficiency in engine repair service.
10. Demonstrate proficiency in management skills.
11. Demonstrate employability skills.
12. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1989

PROGRAM AREA: Industrial SECONDARY NUMBER _____

PROGRAM TITLE: Automotive Service Technology PROGRAM NUMBER: AER0991

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS
--The student will be able to:

01.01 Apply shop safety rules and procedures.
01.02 Use and maintain hand tools such as screwdrivers, special application pliers, hammers, chisels, punches, special application wrenches and sockets, files, hacksaws, bench vises and "C" clamps.
01.03 Demonstrate use of precision measuring tools.
01.04 Use and install fasteners such as screws and bolts, key screw extractors, helicoil inserts and thread cutting taps and dies.
01.05 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks and vehicle hoists.
01.06 Apply basic math skills.
01.07 Use and apply metric and English measurement skills.
01.08 Demonstrate an understanding of lubrication requirements.
01.09 Inspect, remove, replace and adjust all belts.
01.10 Perform auto safety inspection.
01.11 Demonstrate use of technical manuals, specification handbooks and charts.
01.12 Demonstrate an understanding of steering geometry and suspension geometry such as caster, camber, toe-in, king pin inclination (steering axis) and toe-in and toe-out on turns.
01.13 Demonstrate an understanding of the function of steering and suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, ball joints, shackles, idler arm, pitman arm and control arm.
01.14 Demonstrate an understanding of manual and power steering operation such as power steering pump, power steering control valve and power steering fluid leaks.
01.15 Demonstrate an understanding of drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade and lining conditions.
01.16 Demonstrate an understanding of disc brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade and lining conditions.
01.17 Demonstrate an understanding of brake system valve operation such as pressure differential valve, proportional valve, metering valve and brake warning light.
01.18 Demonstrate an understanding of basic heating and cooling systems.
01.19 Demonstrate an understanding of basic air conditioning systems.
01.20 Demonstrate knowledge of engine components.
01.21 Demonstrate an understanding of basic ignition and fuel systems.
01.22 Demonstrate an understanding of rear axle operation such as differential action; limited slip mechanisms; floating, nonfloating and semifloating.

01.23 Demonstrate an understanding of drive shaft operation, drive shaft construction and universal joint operation such as single joint, constant velocity, joint working angle, joint phasing, slip joint, spline output and spline drive shaft.
01.24 Demonstrate an understanding of automatic transmission operation such as fluid coupling, torque converter, planetary gear system, power flow, hydraulic system, lubricant and cooling.
01.25 Demonstrate an understanding of clutch operation.
01.26 Demonstrate an understanding of clutch release mechanisms to include linkage and hydraulic.
01.27 Demonstrate an understanding of manual transmission operation such as torque multiplication, power flow, sliding gears, constant mesh gear, synchronizer action and shift mechanisms.
01.28 Demonstrate an understanding of overdrive operation.
01.29 Demonstrate knowledge of internal engine components.
01.30 Describe electrical terms, magnetism, electrical current flow and Ohm's law.
01.31 Demonstrate an understanding of series circuits.
01.32 Demonstrate an understanding of parallel circuits.
01.33 Demonstrate an understanding of series-parallel circuits.
01.34 Apply basic welding skills related to the automobile industry.
01.35 Demonstrate an understanding of advanced electronics concepts.
01.36 Demonstrate an understanding of electronic schematic diagrams and diagnostic techniques.
01.37 Demonstrate an understanding of electrical/electronic wire repair procedures.
01.38 Demonstrate an understanding of electronic semiconductor concepts and components.
01.39 Demonstrate an understanding of electronic transistor concepts and components.
01.40 Demonstrate an understanding of electronic microprocessor concepts, functions and components.
01.41 Adjust door hinges and striker plates.
01.42 Locate and correct rattles and noises.
01.43 Install door moldings.
01.44 Remove and replace electric window regulators.
01.45 Adjust electric window regulators.
01.46 Install air shocks.
01.47 Install C.B.'s and radios.
01.48 Touch up paint.
01.49 Lubricate hinges.
01.50 Adjust headlights. (ASE)
01.51 Inspect and replace passenger restraints.
01.52 Check vehicle visibility.
01.53 Check and adjust specified fluid levels.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS--The student will be able to:

02.01 Use and apply basic electrical and electronic test equipment and meters.
02.02 Perform power checks with test lights.
02.03 Perform continuity tests.

02.04 Measure voltage drop, current flow and resistance in a circuit or component with a multimeter. (ASE)
02.05 Locate an open circuit and a short circuit.
02.06 Analyze cranking system malfunctions.
02.07 Analyze charging system malfunctions. (ASE)
02.08 Service and test batteries.
02.09 Remove and replace light bulbs. (ASE)
02.10 Test, remove and replace fuses and circuit breakers. (ASE)
02.11 Replace and test starters. (ASE)
02.12 Test and replace alternators.
02.13 Test, remove and replace regulators. (ASE)
02.14 Inspect and repair lighting systems. (ASE)
02.15 Diagnose, repair or replace turn signal and stoplight switches. (ASE)
02.16 Test and replace electrical system switches. (ASE)
02.17 Diagnose, repair or replace power window and power seat systems, including motors.
02.18 Diagnose and service windshield wiper/washer systems. (ASE)
02.19 Test and replace sending units. (ASE)
02.20 Diagnose engine malfunctions.
02.21 Inspect, remove and replace alternator belts.
02.22 Overhaul starters. (ASE)
02.23 Diagnose, repair or replace horn systems. (ASE)
02.24 Diagnose, repair or replace clock systems.
02.25 Diagnose, repair or replace warning buzzer.
02.26 Test and replace instrument panel units. (ASE)
02.27 Diagnose and service cruise control systems. (ASE)
02.28 Check, remove and replace radios. (ASE)
02.29 Test and repair automotive alarm system components. (ASE)

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS--The student will be able to:

03.01 Diagnose suspension problems.
03.02 Diagnose wheel/tire vibrations, shimmy and tramp.
03.03 Diagnose steering problems.
03.04 Lubricate suspension, steering gear and linkage. (ASE)
03.05 Check manual steering gear fluid level. (ASE)
03.06 Inspect steering systems. (ASE)
03.07 Inspect suspension systems. (ASE)
03.08 Inspect and test shock absorbers.
03.09 Check power steering fluid level. (ASE)
03.10 Inspect, repair and replace tires and wheels.
03.11 Rotate wheels and tires. (ASE)
03.12 Balance wheels. (ASE)
03.13 Service wheel bearings and grease seals on nondrive axles/spindles. (ASE)
03.14 Remove and replace spindles and ball joints. (ASE)
03.15 Remove and replace shock absorbers and mountings. (ASE)
03.16 Measure and adjust torsion bar height. (ASE)
03.17 Remove and replace coil springs/torsion bars. (ASE)
03.18 Remove and replace control arms and bushings. (ASE)
03.19 Remove and replace steering linkage components.
03.20 Remove and replace steering dampers. (ASE)

03.21 Remove and replace rear suspension parts. (ASE)
03.22 Remove and replace manual/power steering gear assemblies.
03.23 Check two-wheel alignment.
03.24 Rebuild MacPherson type struts. (ASE)
03.25 Overhaul recirculating ball manual gears.
03.26 Rebuild rack-and-pinion manual gears. (ASE)
03.27 Remove and replace power steering pumps. (ASE)
03.28 Rebuild power steering pumps.
03.29 Overhaul integral steering gears.
03.30 Rebuild rack-and-pinion power steering assembly. (ASE)
03.31 Check four-wheel alignment.

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS--The student will be able to:

04.01 Diagnose brake system problems.
04.02 Diagnose combination valve malfunctions.
04.03 Perform operational inspections.
04.04 Inspect brake assemblies.
04.05 Remove and replace calipers and rotors. (ASE)
04.06 Refinish rotors. (ASE)
04.07 Rebuild calipers. (ASE)
04.08 Refinish brake drums. (ASE)
04.09 Replace drum brake shoes and disc pads. (ASE)
04.10 Inspect and replace brake lines and hoses. (ASE)
04.11 Adjust brake shoes. (ASE)
04.12 Adjust parking brakes. (ASE)
04.13 Rebuild wheel cylinders. (ASE)
04.14 Remove and replace wheel cylinders. (ASE)
04.15 Bleed hydraulic brakes. (ASE)
04.16 Repair or replace parking brake cables and linkage. (ASE)
04.17 Remove and replace master cylinders. (ASE)
04.18 Remove and replace hydraulic power cylinders.
04.19 Flush brake systems. (ASE)
04.20 Service and repair power assist and brake control systems.
04.21 Service and repair front and rear disc brakes.
04.22 Replace hydraulic brake boosters. (ASE)
04.23 Inspect, diagnose and repair anti-locking brake systems.

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SYSTEMS--The student will be able to:

05.01 Diagnose overheating problems.
05.02 Check radiator coolant level.
05.03 Test and add coolant. (ASE)
05.04 Pressure test cooling systems. (ASE)
05.05 Test radiator caps. (ASE)
05.06 Inspect, remove and replace radiator and heater hoses. (ASE)
05.07 Remove, test and replace thermostats. (ASE)
05.08 Flush cooling systems and replace coolant.
05.09 Remove and replace radiators. (ASE)
05.10 Remove and replace water pumps.
05.11 Diagnose basic air conditioning system problems.

05.12 Inspect and pressure test basic air conditioning systems.
05.13 Flush air conditioning systems.
05.14 Discharge, evacuate and charge basic air conditioning systems. (ASE)
05.15 Leak test basic air conditioning systems. (ASE)
05.16 Service air conditioning electrical circuits.
05.17 Service vacuum circuits.
05.18 Remove and replace components in basic air conditioning systems. (ASE)
05.19 Remove and replace engine fan clutches and electric cooling fan and controls.
05.20 Remove and replace blower motors. (ASE)
05.21 Remove and replace heater cores, control units and cables. (ASE)
05.22 Diagnose and repair electronic air conditioning controls.
05.23 Remove and replace air conditioning compressor shaft seals.

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE--
The student will be able to:

06.01 Analyze engine performance.
06.02 Perform running cylinder balance tests.
06.03 Perform cylinder compression tests.
06.04 Check the performance of engines equipped with on-board computers.
06.05 Inspect, remove and replace points and condensers. (ASE)
06.06 Remove and replace distributor. (ASE)
06.07 Check the distributor advance in a vehicle.
06.08 Remove distributor; inspect, test and service.
06.09 Inspect and test primary circuits.
06.10 Remove and replace coils.
06.11 Remove and replace ignition switches and resistors.
06.12 Inspect, remove and replace ignition wires, caps and rotors.
06.13 Remove, gap and replace spark plugs. (ASE)
06.14 Service electronic ignition systems.
06.15 Service air cleaners. (ASE)
06.16 Inspect, remove and replace fuel filters. (ASE)
06.17 Measure fuel flow and pressure.
06.18 Remove and replace fuel lines. (ASE)
06.19 Remove and replace fuel pumps. (ASE)
06.20 Adjust idle speed.
06.21 Clean and adjust chokes. (ASE)
06.22 Inspect, remove and replace manifold control valves.
06.23 Remove and replace fuel injection system filters.
06.24 Set idle speed to specifications.
06.25 Remove and replace fuel injectors. (ASE)
06.26 Service throttle body fuel injection systems.
06.27 Service ported fuel injection systems.
06.28 Service positive crankcase ventilation (PCV) systems. (ASE)
06.29 Service evaporative control systems. (ASE)
06.30 Service thermostatic air cleaners. (ASE)
06.31 Service air-injection systems. (ASE)
06.32 Service exhaust gas recirculation (EGR) systems. (ASE)
06.33 Inspect, remove and replace catalytic converter. (ASE)
06.34 Diagnose mechanical, ignition and fuel emission problems.
06.35 Inspect, remove and replace exhaust system components. (ASE)
06.36 Inspect, remove and replace catalytic converters. (ASE)

06.37 Perform cylinder leakage tests.
06.38 Diagnose and correct malfunctions in computer control systems.
06.39 Diagnose, test and replace on-board computer controls.
06.40 Diagnose, service and replace computerized sensors.
06.41 Clean and overhaul electronically controlled carburetor systems. (ASE)
06.42 Remove and replace turbo chargers. (ASE)
06.43 Rebuild fuel injection pump. (ASE)
06.44 Check and adjust turbo charger waste gates. (ASE)
06.45 Test exhaust emissions using a four gas analyzer.
06.46 Service diesel injectors.
06.47 Remove and replace diesel engine fuel filters.
06.48 Check and adjust injection pump timing.
06.49 Remove and replace injection pumps.
06.50 Check and adjust idle and maximum speeds.
06.51 Test and service preheating systems.

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/ TRANS-AXLE SERVICE--The student will be able to:

07.01 Performance test automatic transmissions.
07.02 Change transmission oil and filter. (ASE)
07.03 Adjust linkage from the engine.
07.04 Adjust shift linkage. (ASE)
07.05 Adjust neutral safety switches.
07.06 Remove and replace external gaskets and seals.
07.07 Test vacuum shift modulator. (ASE)
07.08 Adjust bands. (ASE)
07.09 Pressure flush transmission cooler assemblies.
07.10 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock up and shift problems.
07.11 Diagnose, repair and replace trans-axles.
07.12 Pressure test transmissions in vehicles. (ASE)
07.13 Test the electrical controls of an automatic clutch converter.
07.14 Service governors.
07.15 Service valve bodies.
07.16 Rebuild transmission assemblies. (ASE)
07.17 Rebuild automatic trans-axle.
07.18 Pressure flush converter assemblies.
07.19 Remove and replace extension housings and bushings.

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES--The student will be able to:

08.01 Diagnose drive line problems.
08.02 Diagnose and performance test manual transmission problems.
08.03 Inspect drive shafts, universal joints and center bearings.
08.04 Lubricate universal joints. (ASE)
08.05 Remove and replace transmission mounts. (ASE)
08.06 Remove and replace transmissions.
08.07 Adjust shift linkage. (ASE)
08.08 Adjust clutches. (ASE)
08.09 Remove and replace extension housing seals and bushings. (ASE)

08.10 Remove and replace clutches, release bearings, linkage and pilot bearings.
08.11 Rebuild or replace clutch master and slave cylinders. (ASE)
08.12 Remove and replace universal joints. (ASE)
08.13 Remove and replace speedometer gears and service speedometer cables. (ASE)
08.14 Remove and replace drive axle bearings and seals. (ASE)
08.15 Service and repair differentials. (ASE)
08.16 Remove and replace trans-axle assemblies.
08.17 Adjust trans-axle shifting controls.
08.18 Inspect, remove, replace and lubricate front drive axle flexible joints and boots.
08.19 Inspect, remove and replace constant-velocity universal joints.
08.20 Service manual transmissions to include overdrives. (ASE)
08.21 Overhaul trans-axle assemblies. (ASE)

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE--
The student will be able to:

09.01 Clean engines. (ASE)
09.02 Remove and replace motor mounts.
09.03 Check valve guides for wear.
09.04 Reface valves and seats.
09.05 Perform cylinder balance tests.
09.06 Perform cylinder compression tests.
09.07 Perform cylinder leakage tests. (ASE)
09.08 Determine source(s) of oil/coolant loss.
09.09 Determine source(s) of excess noise. (ASE)
09.10 Determine cause(s) of overheating. (ASE)
09.11 Check the engine oil pressure.
09.12 Remove and replace core plugs. (ASE)
09.13 Inspect, remove and replace flywheels and ring gears.
09.14 Remove and replace engine assemblies. (ASE)
09.15 Remove and replace oil pans. (ASE)
09.16 Remove and replace oil pumps.
09.17 Clean cylinder blocks, oil passages and pistons.
09.18 Inspect blocks for warpage. (ASE)
09.19 Measure and inspect engine components for proper tolerances.
09.20 Remove and replace crankshafts, mains and rod bearings. (ASE)
09.21 Remove and replace camshafts and bushings. (ASE)
09.22 Remove and replace pistons and rings. (ASE)
09.23 Remove ridges and deglaze cylinder walls.
09.24 Remove and replace front and rear oil seals.
09.25 Remove and replace intake and exhaust manifolds. (ASE)
09.26 Remove, clean, inspect and replace cylinder heads; and inspect heads for cracks and warpage. (ASE)
09.27 Test and replace hydraulic lifters.
09.28 Remove and replace timing chains, belts and gears. (ASE)
09.29 Test valve springs. (ASE)
09.30 Adjust valve lifters. (ASE)
09.31 Replace rocker arm assemblies. (ASE)
09.32 Change oil and oil filters.

10.0 DEMONSTRATE PROFICIENCY IN MANAGEMENT SKILLS --The student will be able to:

10.01 Write and process work orders.
10.02 Process parts warranties and labor claims.
10.03 Process merchandise returns.
10.04 Accept and return cores/cards for rebuilt and exchange items.
10.05 Select and care for shop materials.
10.06 Use supervisory techniques for hiring and firing.
10.07 Prepare technical reports.
10.08 Perform business and technical computations.
10.09 Evaluate productivity.
10.10 Develop a customer relations plan.
10.11 Plan service facilities.
10.12 Schedule production.
10.13 Plan, organize, activate and control a service operation.
10.14 Perform auto safety inspections.

11.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents which may be required when applying for a job.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify and adopt acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes appropriately.
11.09 Demonstrate acceptable employee health habits.

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP-- The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.
12.06 Identify the business skills needed to operate a small business efficiently and effectively.

PROGRAM IMPLEMENTATION

It is the teacher's responsibility to ensure that students learn how to competently perform the tasks specified in the course objectives. Therefore, the teacher must lead the students through the learning experiences in a course, motivate students, act as a role model for students and, at times, function as a guidance counselor and placement coordinator. This leadership role requires the teacher to participate in many of the activities required for program implementation. The teacher must select the methods of instruction that best apply to students' ability levels, measure student achievement and provide feedback. Key factors that must be considered when implementing this program are addressed below.

TEACHER CHARACTERISTICS

Subject Knowledge

The teacher must be a subject matter expert who is able to implement sound instructional methods and evaluate student performance. He/she must have significant work experience in the industry/vocational field and be able to communicate that knowledge to the students.

Instructional Delivery

The teacher's role in the learning process is to motivate and lead the student as well as impart subject matter knowledge. In order to maximize student learning, the use of a variety of instructional methods is encouraged. Because teaching styles vary greatly, teachers are highly encouraged to "pick and choose" from various methods or to combine methods for maximum benefit to students. Some of the more traditional methods used are lecture, demonstration and small group instruction. Other teaching methods which are suggested for further exploration include individualized self-paced, open-exit/open-entry, contract, computer based and competency based instruction. The focus of Competency Based Vocational Education (CBVE) is to ensure that each student can competently perform tasks specified before progressing to more complex skills.

CONVENTIONAL INSTRUCTIONAL METHODS

A vocational program may require a portion of the instruction to be presented in a standard lecture or controlled demonstration format. These methods of instruction can be easily combined with instructor controlled step-by-step practical exercises. Some instructional activities may dictate that this instructional approach be used to introduce students to hazardous equipment often utilized in vocational training. In most situations, students should be required to perform specified activities to achieve maximum skill competency. If mastery of a task is required, competency based education methods may be more appropriate. However, if the training activity involves an orientation or a seldom performed, non-essential task, conventional instructional methods may be more effective. Teachers are encouraged to use a variety of instructional methods to best meet instructional objectives.

Instructional Development

Teachers often must develop and select their own teaching and curriculum materials. In developing a comprehensive curriculum, instructional objectives based upon both the performance and cognitive domain must be included. When developing curriculum materials, teachers must use the curriculum framework (CF) and student performance standards (SPS) contained in this program guide as a basis. These materials delineate minimum program content which must be presented for an approved vocational training program. However, they are not intended for use as a comprehensive curriculum. Be certain not to adapt the curriculum to available materials, but select only those materials which can be adapted to the curriculum.

Instructional Measurement

Teachers must select testing methods that support the instructional delivery system used. Teachers must be competent to develop, administer and evaluate written and performance type tests.

Student Admissions Criteria

Providing the student the opportunity to successfully complete a vocational education program, in any institution, should be the primary concern of the instructional effort. Therefore, it is very important to direct planning and effort into identifying and selecting students with excellent potential for success in the educational program and in the occupation. The school's primary task is to prepare people for fulltime, entry-level positions as technicians or, in the case of those with more experience, as managers.

The Course Code Directory, specifies grade levels at which occupational programs are offered. Specific student admissions criteria which is required by the State and local educational agencies for the Automotive Service Technology training program is illustrated as follows.

SPECIFIC ADMISSIONS CRITERIA

Minimum Age:	As required by state and local policy
Physical Requirements:	None
Special Requirements:	None
Minimum Basic Skills Math Level:	* 8.0
Minimum Basic Skills Language Level:	* 8.0

* This grade level requirement is specified in the Curriculum Framework and is applicable to postsecondary level programs of 450 hours or more only. There is no minimum basic skill requirement for secondary programs.

THE STUDENT PROFILE

Developing a student profile is an important step in program implementation. Attention should focus on student characteristics that can be remediated within a training program, but could create serious impediments to success in the vocational field. Typical of these would be deficiencies in communications and mathematical skills. The basic skill levels can be measured by testing. Test results can then be used to direct the student to more suitable training which matches his or her skill level, or to determine supplemental training which may be required to increase chances for student success.

High school and postsecondary vocational students can be admitted to a vocational program upon request if they meet any specified prerequisites, such as physical or basic skill requirements. Training programs should be accessible to as many students as possible. Training programs are designed to prepare students for employment upon graduation, or serve as prerequisite to a postsecondary program.

The community college can be more selective and establish stringent admission standards. This may be done by assessing applicants or by recruiting potential students who meet the established prerequisite requirements of the training. The program advisory committee can design a profile of the potentially successful student. The profile should contain a

list of qualities, traits and aptitudes that will indicate a higher potential for student success. Acceptable levels for these traits must also be determined. For example, the qualities deserving highest attention, mechanical ability and cognitive aptitude, are those which the educational program itself will not likely be able to influence, although these traits should have considerable weight in establishing the basic profile. Deficiencies in mathematical or communications skills may lend themselves to improvement through related instruction while the student is enrolled in the program. The following example illustrates specific qualities to consider when establishing the student profile:

Mechanic/Technician--Service

- Knowledge of basic tools and equipment used by mechanics/technicians
- Ability to analyze and solve mechanical and technical problems
- Ability to interpret written mechanical/technical materials
- Ability to interpret mechanical/technical drawings
- Mechanical dexterity

Mechanic/Technical Service Management

- Basic application of service
- Business skills
- Ability to work with people
- Communications skills
- Leadership

QUALIFYING AND PRETESTING

Assessing potential students for vocational programs is an integral part of the recruiting process since considerable amounts of time and money will be spent on students entering training. Recruiters must have a good idea of the candidate's basic aptitude. Whoever guides the candidate to the program needs to have knowledge of the student's interests, abilities and experience. These can be measured by a variety of assessment methods, which should be performed upon program entry. The assessment can help determine extent and level of training each individual should receive.

Assessment should determine the level at which the student can read, write, calculate mathmatics and understand the English language. It is appropriate for the program advisory committee and the school to develop some selection criteria based on minimum skill levels. These criteria should remain flexible in order to maximize educational opportunity for all applicants. Additionally, vocational educators must make every effort to serve the variety of "special needs" students and to eliminate sex-bias and stereotyping in all occupational areas.

ADVISORY COMMITTEE

It is imperative that representatives of industry be organized into an advisory committee. Constantly changing technological demands of our society will continue to stimulate changing industrial patterns. Therefore, effective use of program advisory committees is vital to the successful implementation of vocational training programs. Advisory committees provide expert technical advice which is not easily obtainable elsewhere, offer external support of policies and have tremendous public relations potential.

The most effective advisory committees are those whose members have mutual respect for each other's abilities and vested interest in the training program because of their need for trained workers. The program advisory committee is also one of the most effective means of facilitating placement. Its role can be:

- To contact local industry and encourage them to use the school's placement office as a means of filling jobs
- To develop an effective procedure for interviewing and evaluating potential employees suggested by the school
- To assist in gathering accurate and current job information as it becomes available

COUNSELING AND GUIDANCE

Counseling of students serves two purposes. It guides the student into the program and it supports enrolled students on a continuing basis throughout the program. Much day-to-day counseling will be the responsibility of the teacher. The teacher has the most contact with the student and is in a position to detect and correct a problem. Each student will encounter new problems as the program develops. The teacher's job is to work with the student to help identify problems and then strive for solutions. The teacher will provide much of the counseling that focuses on trade knowledge and skills.

The professional counselor cannot be expected to have the subject matter expertise of the primary teacher. The counselor, however, can focus on the student's needs related to other issues such as personal growth, interests and attitudes. The ideal situation will provide at least one counselor with current knowledge of industry standards for career counseling. A useful tool which should be used in the counseling process is the Career Merit Achievement Plan (Career MAP) which presents minimum instructional content keyed to student performance standards. Career MAPs are available for each industrial program area, and can be used to document student achievement, isolate student interests, talents and weaknesses. They are also useful for placement purposes. Information on Career MAPs may be obtained by contacting the Department of Education, Division of Vocational, Adult, and Community Education, (904) 488-0484.

STUDENT PLACEMENT

Implementing an effective placement system is integral to developing a successful vocational training program. **S.B.E. Rule 229.551 (3)(g)** requires 70 percent placement of students who have completed a vocational training program. Although placement is not always a problem, as with students already working in a related occupation, the placement program should place emphasis upon students who are seeking entry-level employment since these students have little or no experience with industry.

The task of the placement program is to locate job openings in the community. The placement coordinator or teacher must know each student's personal aims and interests in addition to the information stated on the achievement record. In many cases, teachers are the best source to match students to job openings because of their contacts with the industry advisory committee. Input concerning employment openings must come from individual business establishments in the community. The placement coordinator should introduce a student to as many suitable job openings as possible. Conversely, employers can then be expected to interview as many qualified candidates as possible.

Cooperative Education

COOPERATIVE EDUCATION APPLICABILITY

Normally, students will complete the entire program as full-time students before obtaining employment. However, there may be situations where students could be allowed to complete part of the program while employed in their occupational areas. At this time it is appropriate for the student to enroll in industrial cooperative education (ICE). Guidelines for this training plan are provided in the "Industrial Cooperative Education Program Guide," published by the Division of Vocational, Adult, and Community Education, Order # IE 508 BK 87.

Industrial cooperative education is a method of instruction designed to prepare students for jobs in the community. This method is a joint effort between the school and the business community. Student trainees receive a combination of instruction in the classroom and related on-the-job training through employment. Learning experiences are jointly planned and supervised by the teacher and the employer. Cooperative education is relevant to the needs of the student preparing for a work role, and will help the student to achieve success and personal satisfaction as the transition is made from school to the constantly changing world of work.

Cooperative education is defined in the Federal Register, Volume 39, number 143, Vocational Education, Section 102.96, as a program ". . . to prepare students for employment, through: (a) providing meaningful work experiences combined with formal education enabling students to acquire knowledge, skills, and appropriate attitudes, (b) removing the artificial barriers which separate work and education, (c) involving educators with employers, creating interaction whereby the needs and problems of both are made known, thereby making it possible for occupational curricula to be revised to reflect current needs in various occupations . . . ."

PURPOSE

Cooperative Education is for persons who, through written cooperative arrangements between the school and employers, receive instruction, including required academic courses and related instruction by alternation of study in school with a job in any industrial occupational field. These two experiences must be planned and supervised by the school and employers so that each contributes to the student's education and employability. Work periods and school attendance may be on alternative half days, full days, weeks or other periods of time to fulfill objectives of the cooperative education program.

GOALS AND OBJECTIVES

The primary goal of the cooperative method of vocational education is to prepare skilled, responsible individuals who can assume a productive role in the community. Specific objectives to meet the primary goal are:

- To prepare individuals for employment, adjustment and advancement in specified occupations or occupational areas (primary objective)
- To provide an understanding of the contribution of work to the social and economic welfare of our nation
- To provide students with an understanding and appreciation of the American free enterprise system
- To foster an awareness of the civic, social and moral responsibilities of individuals to society

- To stimulate students' interest in their chosen occupational fields and provide an understanding of the opportunities in each field
- To provide training that results in increased efficiency in performing job tasks
- To provide curriculum which is sensitive and adaptable to changes in occupational practices and procedures as they are affected by societal, economic, technical and educational developments
- To strive to develop a greater appreciation of the value of specifically trained personnel among employers, employees and consumers
- To reinforce skills learned in the school laboratory
- To provide experiences on tools and equipment not available in the school laboratory
- To supplement and broaden the school curriculum into areas not otherwise available

Student Organization Participation

Vocational student organizations operate pursuant to federal and state laws, which authorize them as viable components of vocational education programs. According to federal regulations, the vocational education program of instruction may include activities of vocational student organizations which are an integral part of the vocational instruction offered and which are supervised by vocational education personnel. The **S.B.E.** Rules authorize vocational student organizations as an integral part of the vocational education program as stated in **S.B.E. 6A-6.064 (7)** and **6A-6.065 (8).**

VOCATIONAL INDUSTRIAL CLUBS OF AMERICA (VICA)

VICA is an organization for secondary or postsecondary students enrolled in trade and industrial education programs in high schools, area vocational technical centers and junior and community colleges. It is the only national and international organization for trade and industrial students. The organization is designed to expand and enrich opportunities for leadership, social awareness and civic responsibility in vocational students.

Students who participate in VICA activities are often better prepared for the world of work. They acquire knowledge of the many opportunities available in their chosen careers and become aware of the value of their

contributions to society. They are also given opportunities to develop and utilize their talents and abilities in ways that otherwise would not be available to them.

BENEFITS OF VICA MEMBERSHIP FOR THE STUDENT

Membership in VICA offers the student the opportunity for growth and development in the following areas:

School and Community Service Activities Students in VICA become involved in various school and/or community services. These may include clothing or food collections for the needy, donation of time and service to the elderly and participation in fund raisers or similar activities.

Social Interaction with Fellow Students Activities are also available that offer students time for relaxation and fun. Social activities of this type may be held on a regular basis. They might be held on the school campus during school hours, or off campus after school. More formal functions would include end of the year award banquets or industry/employer appreciation dinner banquets.

Competition in Skill and Leadership Contests VICA offers various contests in all the skill and leadership areas it serves. Often, teachers identify talented students who represent their school in regional competitions. However, any student member of VICA may compete. Instructors should conduct planned contests within their trade areas. This also pertains to leadership areas. First and second place regional winners then move on to the state level contest. The state winners then compete at the national level of the United States Skill Olympics.

INSTRUCTIONAL RESOURCES

STUDENT REFERENCE MATERIALS

Necessary instructional texts or pertinent material should be available for each student to satisfy training objectives. When textbooks are used, the copyright date should be as current as possible.

SERVICE MANUALS

Manuals with current manufacturer's service procedures and specifications should be available. These manuals must be located where students can use them while working in the shop area.

PERIODICALS

Current general and technical magazines and newspapers should be available for student and instructor use.

The following list of suggested resources is organized under each outcome shown in the curriculum framework. These resources have been recommended by instructors and program administrators through statewide surveys.

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Cooling System STA-MC4A,I	TEACHING AIDS, INC.	computer software
Electrical Circuit STA-MC6A,I	TEACHING AIDS, INC.	computer software
Engine Tune-up STA-MC8A,I	TEACHING AIDS, INC.	computer software
Fuel Systems--Carburetors STA-MC2A,I	TEACHING AIDS, INC.	computer software
General Engine Operating Principles STA-MC1A,I	TEACHING AIDS, INC.	computer software
Hydraulics STA-MC7A,I	TEACHING AIDS, INC.	computer software
Ignition System STA-MC5A,I	TEACHING AIDS, INC.	computer software
Lubrication STA-MC3A,I	TEACHING AIDS, INC.	computer software
Air Conditioning 37-2998	GRAVES-HUMPHREYS	film
Auto Chassis Systems 37-2990	GRAVES-HUMPHREYS	film
Auto Engine Systems 37-3128	GRAVES-HUMPHREYS	film
Auto Mechanics Tools and Basic Skills 31036-970	VOCATIONAL MEDIA ASSOCIATES	film
Automotive Hand Tools 37-1388	GRAVES-HUMPHREYS	film

Automotive Service and Repair Microfiche System	MITCHELL INFORMATION SERVICES, INC.	film
Brakes 37-2912	GRAVES-HUMPHREYS	film
Drive Lines and Differentials 37-2892	GRAVES-HUMPHREYS	film
Emission Control Systems 37-3122	GRAVES-HUMPHREYS	film
Engine Electrical Systems 37-3076	GRAVES-HUMPHREYS	film
Engine Mechanical Systems 37-3012	GRAVES-HUMPHREYS	film
Engine Tune-up 37-3096	GRAVES-HUMPHREYS	film
Fuel, Induction and Exhaust Systems 37-3054	GRAVES-HUMPHREYS	film
General Auto Mechanics: Basic Skills 31077-970	VOCATIONAL MEDIA ASSOCIATES	film
How the Automobile Works 30959-970	VOCATIONAL MEDIA ASSOCIATES	film
Lubrication and Cooling Systems 37-3030	GRAVES-HUMPHREYS	film
Measuring Tools Explained Bergwall	BERGWALL PRODUCTIONS	film
Metric Measuring Explained Bergwall	BERGWALL PRODUCTIONS	film
Shop Math Bergwall	BERGWALL PRODUCTIONS	film
Suspensions, Steering and Alignment	GRAVES-HUMPHREYS	film
Transmissions 37-2876	GRAVES-HUMPHREYS	film

Understanding the Automobile 37-0092	GRAVES-HUMPHREYS	film
Wheels and Tires 37-2964	GRAVES-HUMPHREYS	film
Chilton's Motor/Age Magazine	CHILTON BOOK COMPANY	magazine
Introduction to Automotive Mechanics (IE 002 SS 82)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module
Auto Fuel Lubricating and Cooling System William Crouse	McGRAW HILL BOOK COMPANY	text
Auto Mechanic Fundamentals Martin W. Stockel	GOODHEART-WILLCOX COMPANY, INC.	text
Auto Mechanics Mitchell	PRENTICE-HALL, Division of Simon & Schuster	text
Auto Mechanics Fundamentals - Workbook	SOUTHWESTERN PUBLISHING	text
Auto Mechanics Service and Repair Stockel	GOODHEART-WILLCOX COMPANY, INC.	text
Auto Mechanics Theory and Service de Kruger / Kovrcih / Bono	SOUTHWESTERN PUBLISHING	text
Auto Mechanics Theory and Service - Workbook	SOUTHWESTERN PUBLISHING	text
Auto Service and Repair Martin W. Stockel and James E. Duffy	GOODHEART-WILLCOX COMPANY, INC.	text
Auto Service and Repair - Workbook	SOUTHWESTERN PUBLISHING	text
Automotive Encyclopedia William K. Toboldt and Harry Johnson	GOODHEART-WILLCOX COMPANY, INC.	text

Automotive Engine Tune-Up and Diagnosis James G. Hughes	PRENTICE-HALL, Division of Simon & Schuster	text
Chilton's Import Car Alan Turner	CHILTON BOOK COMPANY	text
Chilton's Labor and Parts Manual Chilton Book Company	CHILTON BOOK COMPANY	text
Comprehensive Auto Mechanics Hathaway and Lindbeck	BENNETT AND McKNIGHT - GLENCOE PUBLISHING	text
Diesel Fundamentals, Service, and Repair Tobolt	GOODHEART-WILLCOX COMPANY, INC.	text
General Motors Service Manuals	GENERAL MOTORS SERVICE MANUALS	text
Management Guide to Using Florida Automotive Mechanics Curriculum (IE 114 BK 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Math for the Automotive Trade Peterson / de Kryger	SOUTHWESTERN PUBLISHING	text
Mathematics For Auto Mechanics Hendrik, La Fevor	DELMAR PUBLISHING	text
Modern Power Mechanics Gary E. Grannis	BOBBS-MERRILL COMPANY	text
NAPA Guide to ASE Testing	NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)	text
Oklahoma Curriculum (Measuring, Brakes, Welding, Air Conditioning)	OKLAHOMA STATE DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION	text
Ram Fuel Injector Manual Ram Products	RAM PRODUCTS, INC.	text
Toyota Service News H-100	TOYOTA	text

Automotive Hand Tools Explained 430	BERGWALL PRODUCTIONS	video
Automotive Shop Safety 411	BERGWALL PRODUCTIONS	video
How to Use Automotive Precision Tools 420	BERGWALL PRODUCTIONS	video

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Cranking Motors	AC-DELCO DIVISION	chart
Fundamentals of Delcotron Generators - AC Type	AC-DELCO DIVISION	chart
High Energy Ignition Systems	AC-DELCO DIVISION	chart
Ignition System	AC-DELCO DIVISION	chart
Transistor Regulators	AC-DELCO DIVISION	chart
Series 1800 Autotech Electricity/Electronics, Computer Interface* AT-1803	AUTOMOTIVE TECHNOLOGY TRAINING	computer software
20,000 Volts Under the Hood - The Ignition Circuit 9020FC	AC-DELCO DIVISION	film
Career Aids Electrical System Harold F. Blanchard, Ralph Pitchen	MT. SAN GARINTO COLLEGE	film
Electronic Fuel Injector: Basic System and Trouble Shooting 31320-970	VOCATIONAL MEDIA ASSOCIATES	film
High Energy Ignition System 9024FC	AC-DELCO DIVISION	film

The Cranking Circuit 9025FC	AC-DELCO DIVISION	film
Troubleshooting 09452-970	VOCATIONAL MEDIA ASSOCIATES	film
Finding the Problem: Troubleshooting On-Board Computer Systems Vocational Media Associates 31322-970	PRENTICE-HALL MEDIA	film or video
Ignition Testing Procedures Vocational Media Associates 31359-970	PRENTICE-HALL MEDIA	film or video
Ignition Timing Procedures Vocational Media Associates 31360-970	PRENTICE-HALL MEDIA	film or video
Primary Circuit Testing Vocational Media Associates 31358-970	PRENTICE-HALL MEDIA	film or video
Servicing Automobile Electric Starters Vocational Media Associates 31024-970	PRENTICE-HALL MEDIA	film or video
Troubleshooting Automotive Electrical Systems Vocational Media Associates 31323-970	PRENTICE-HALL MEDIA	film or video
Troubleshooting the Ignition System: Testing and Service Vocational Media Associates VO45-970	PRENTICE-HALL MEDIA	film or video
Troubleshooting with Electronic Test Equipment Vocational Media Associates 31321-970	PRENTICE-HALL MEDIA	film or video
Electrical Systems Service (IE 007 SS 83)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module

Alternator Service and Testing Procedures FPS-7525	FORD PARTS & SERVICE DIVISION, Ford Motor Corporation, General Office	text
Auto Engines and Electrical Systems Motor	MOTOR BOOK COMPANY	text
Auto Mechanic's Guide To Electronic Instrumentation and Microprocessors L.S. Mosher	PRENTICE-HALL, Division of Simon & Schuster	text
Automotive Chassis and Accessory Circuits Mathias Brejcha and Clifford Samuels	PRENTICE-HALL, Division of Simon & Schuster	text
Automotive Computers and Control Systems Tom Weathers Jr., and Claud C. Hunter	PRENTICE-HALL, Division of Simon & Schuster	text
Automotive Electrical Service Manual Don Wetland	PRENTICE-HALL, Division of Simon & Schuster	text
Automotive Electrical Systems Herbet E. Ellinger	PRENTICE-HALL, Division of Simon & Schuster	text
Automotive Electrical and Electronic Systems Frank C. Derato	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text
Automotive Electronics Training Course Vince Fiscelli	JAEGER CORPORATION	text
Automotive Electronics and Electrical Equipment William Crouse	McGRAW HILL BOOK COMPANY	text
Batteries 5133B	AC-DELCO DIVISION	text

Battery Service and Testing Procedures FPS-7537	FORD PARTS & SERVICE DIVISION, Ford Motor Corporation, General Office	text
Computerized Engine Controls	MITCHELL INFORMATION SERVICES, INC.	text
Delcotron Generator and the Charging System - Passenger Car 10-DN Series 5133M	AC-DELCO DIVISION	text
Domestic Cars and Trucks and Foreign Cars and Trucks	MITCHELL INFORMATION SERVICES, INC.	text
Driveability Test Procedure - Charging System Chrysler	CHRYSLER CORPORATION	text
Electricity, The Theory and Basic Circuitry	GENERAL MOTORS CORPORATION	text
Electronic Ignition Service Manual	NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)	text
Fundamentals of Computer Command Control	GENERAL MOTORS CORPORATION	text
Fundamentals of Electricity and Magnetism 5133A	AC-DELCO DIVISION	text
Fundamentals of Semiconductors 5133J	AC-DELCO DIVISION	text
General Motors Computerized Engine Control MTMI to Models	MITCHELL INFORMATION SERVICES, INC.	text
Generators - DC Type 5133E	AC-DELCO DIVISION	text
Getting Started in Electronics Forrest M. Mims III	RADIO SHACK	text
High Energy Ignition System 5133H	AC-DELCO DIVISION	text

How To Read and Understand Electrical Diagrams	FORD MOTOR CORPORATION, GENERAL OFFICE	text
Integral Charging System - With Built-in Regulator 5133S	AC-DELCO DIVISION	text
Mitchell Automotive Electrical Systems Mitchell Information Service Inc.	PRENTICE-HALL, Division of Simon & Schuster	text
Specialized Electronic Training	GENERAL MOTORS CORPORATION	text
Transistor Regulators 5133L	AC-DELCO DIVISION	text
Series 1800 Autotech Electricity/Electronics, Auto Electricity Course* AT-1810	AUTOMOTIVE TECHNOLOGY TRAINING	text & video
Series 1800 Autotech Electricity/Electronics, Auto Electronics Course* AT-1820	AUTOMOTIVE TECHNOLOGY TRAINING	text & video
Advanced Electronic Ingition Tune Up 464	BERGWALL PRODUCTIONS	video
Alternating Current 802	BERGWALL PRODUCTIONS	video
Auto Microprocessors Explained 481	BERGWALL PRODUCTIONS	video
Basic Electronic Test Instruments 823	BERGWALL PRODUCTIONS	video
Direct Current 801	BERGWALL PRODUCTIONS	video
Electronic Ignition Explained 426	BERGWALL PRODUCTIONS	video

Electronic Ignition Tune Up Peter Novellino and Stephen Mercaldo 462	BERGWALL PRODUCTIONS	video
How to do a Major Tune-Up 402	BERGWALL PRODUCTIONS	video
The Alternator Explained 439	BERGWALL PRODUCTIONS	video
The Ignition System Explained 401	BERGWALL PRODUCTIONS	video
The Starting System Explained 435	BERGWALL PRODUCTIONS	video
Troubleshooting Electrical Components 461	BERGWALL PRODUCTIONS	video
Troubleshooting The Vat 40 441	BERGWALL PRODUCTIONS	video

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
TRW Brochures, Wall Charts, Posters (CHASSIS)	TRW REPLACEMENT PARTS DIVISION	chart
Front End Explained Peter Novellino and Stephen Mercaldo	BERGWALL PRODUCTIONS	film
Light Beam Alignment 446	BERGWALL PRODUCTIONS	film
Off-The-Car Dynamic Wheel Balance MSJ-AT-E-3C	TEACHING AIDS, INC.	film
Pre-Alignment Checks MSJ-AT-E-2B	TEACHING AIDS, INC.	film

Steering Geometry MSJ-AT-E-2A	TEACHING AIDS, INC.	film
Steering and Suspension Systems Vocational Media Associates 30977-970	PRENTICE-HALL MEDIA	film
The Front End Explained B-403	TEACHING AIDS, INC.	film
The GM MacPherson Strut System Vocational Media Associates 31039-970	PRENTICE-HALL MEDIA	film
The Power Steering Pump Vocational Media Associates 09450-970	PRENTICE-HALL MEDIA	film
The Rack and Pinion Power Steering Assembly Vocational Media Associates 09449-970	PRENTICE-HALL MEDIA	film
The Saginaw Power Steering Gear Box Vocational Media Associates 09448-970	PRENTICE-HALL MEDIA	film
Steering, Suspension and Wheel Service (IE 003 SS 82)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module
Auto Mechanics - Suspension - Brake - Steering	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Automotive Brakes, Suspension and Steering Crouse and Anglin	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text
Automotive Brakes, Suspension and Steering - Workbook Crouse and Anglin	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text
Principals of Front End Alignment Miles Bacon	McGRAW HILL BOOK COMPANY	text

Product Catalog	AMMCO TOOLS, INC.	text
Service Manual - Engine Chassis Chrysler	CHRYSLER CORPORATION	text
Specialty Products Company Wheel Alignment	FORD MOTOR CORPORATION, GENERAL OFFICE	text
Steering Suspension and Wheel Service E. Miles Bacon	FLORIDA STATE UNIVERSITY	text
Total Alignment Video Tape	HUNTER ENGINEERING COMPANY	text
Wheel Alignment Equals Motion Balance Lee Hunter	HUNTER ENGINEERING COMPANY	text
Wheel Alignment Equipment	SNAP ON TOOLS CORPORATION	text
Wheel Alignment Manual No. 1300	AMMCO TOOLS, INC.	text
Wheel Alignment Specifications	AMMCO TOOLS, INC.	text
Wheel Alignment Specifications	FORD MOTOR CORPORATION, GENERAL OFFICE	text
Wheel Alignment-Simplified	BEAR AUTOMOTIVE	text
Principles of Wheel Alignment Service E. Miles Bacon	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text & film
Electronic Wheel Balancing 449	BERGWALL PRODUCTIONS	video
How to Balance Wheels 417	BERGWALL PRODUCTIONS	video
MacPherson Strut How To	SPECIALTY PRODUCTS COMPANY	video
The Front End 403	BERGWALL PRODUCTIONS	video

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Bleeding the Brakes Vocational Media Associates 31072-970	PRENTICE-HALL MEDIA	film
Disc Brake Service MPI-8013	TEACHING AIDS, INC.	film
Drum Brake Service MPI-8012	TEACHING AIDS, INC.	film
How to Use a Disc Laths	BERGWALL PRODUCTIONS	film
Hydralulic Brake Service Vocational Media Associates 30962-970	PRENTICE-HALL MEDIA	film
Master Cylinder Service MSJ-AT-F-4A	TEACHING AIDS, INC.	film
Single Piston Disc Brake Caliper Service MSJ-AT-F-7B	TEACHING AIDS, INC.	film
The Brake Lathe Vocational Media Associates 31019-970	PRENTICE-HALL MEDIA	film
Wheel Cylinder Service MSJ-AT-F-3A	TEACHING AIDS, INC.	film
Automotive Brake Service (IE 008 SS 83)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module
Automotive Brake	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text

Automotive Brake System Louise Justice and Margaret Van Every	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Automotive Suspension, Steering, and Brakes Ellinger and Hathaway	PRENTICE-HALL, Division of Simon & Schuster	text
Brake Service # 9775	AMMCO TOOLS, INC.	text
Brake Service Manual - Disc/Drum	NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)	text
Disc Brake Service Guide AU-1599	WAGNER DIVISION McGRAW-EDISON COMPANY	text
Disc Brake Service Manual # 9424	AMMCO TOOLS, INC.	text
EIS Brake Service Manual 799	PARKER HANNIFIN CORPORATION	text
Foreign Car Brake Service Manual	NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)	text
Guide for Preventing Asbestos Disease U.S. Government	U. S. GOVERNMENT PRINTING OFFICE	text
Hydraulic Disc and Drum Brake Diagnostic Analysis and Reconditioning Manual AU-1600	WAGNER DIVISION McGRAW-EDISON COMPANY	text
Modern Automotive Mechanics James Duffy	GOODHEART-WILLCOX COMPANY, INC.	text
Pocket Catalog on Specialty Tools Equipment	K-D MANUFACTURING COMPANY	text
Product Catalog	AMMCO TOOLS, INC.	text
Don't Blow it Color Film Company Video Division	COLOR FILM COMPANY VIDEO DIVISION	video

How to Diagnose Hydraulic Brake Problem 422	BERGWALL PRODUCTIONS	video
How to Use a Drum Lathe 418	BERGWALL PRODUCTIONS	video
The Hydraulic Brake System Explained 404	BERGWALL PRODUCTIONS	video

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SERVICES

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
A/C Principle of Operation Ford Service Manual	FORD MOTOR CORPORATION, GENERAL OFFICE	film
How to Service the Cooling System	BERGWALL PRODUCTIONS	film
Mitchell Automotive Audio Visual Training Program Mitchell Information Service Inc.	MITCHELL INFORMATION SERVICES, INC.	film
Heating and Air Conditioning Service (IE 009 SS 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module
A/C Controls The Chevrolet Productivity Network	GENERAL MOTORS CORPORATION	text
AC and Heating Service Manual	EVERCO INDUSTRIES	text
Air Conditioner and Heater Manual	MOTOR BOOK COMPANY	text
Automotive A/C Boyce Dwiggins	DELMAR PUBLISHING	text

Automotive Air Conditioning Crouse and Anglin	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text
Automotive Air Conditioning Basic Service Training Manual Mitchell	MITCHELL INFORMATION SERVICES, INC.	text
Automotive Air Conditioning and Climate Control James M Kirkpatrick and Michael K. Weaver	BOBBS-MERRILL COMPANY	text
Automotive Air Conditioning and Heating Ivan Hinerman and Tom Birch 0-02818630-3	BENNETT AND McKNIGHT - GLENCOE PUBLISHING	text
Automotive Air Conditioning and Heating Ivan Hinerman and Tom Birch 0-02818620-6	BENNETT AND McKNIGHT - GLENCOE PUBLISHING	text
Basic A/C Heating Service Manual	NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)	text
Basic A/C Training Manual Mitchell Manual	NATIONAL AUTO SERVICE	text
Cooling System Catalogs	HAYDEN BOOK COMPANY	text
Driveability Test - Electrical Heat - A/C Chrysler	CHRYSLER CORPORATION	text
Automotive Air Conditioning Training Program	MITCHELL INFORMATION SERVICES, INC.	text & slides
The Automotive Air Conditioner 442	BERGWALL PRODUCTIONS	video
The Automotive Cooling Systems 406	BERGWALL PRODUCTIONS	video

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Four Cylinder Engine Maintenance G.M.	CHEVROLET MOTOR DIVISION	film
Motor Auto Repair Manual Forier SAE	MOTOR BOOK COMPANY	film
Servicing the General Motors Emission Control System Vocational Media Associates 31058-970	PRENTICE-HALL MEDIA	film
Understanding the Turbocharger 09424-970	VOCATIONAL MEDIA ASSOCIATES	film
Computer Control Vocational Media Associates 09388-970	PRENTICE-HALL MEDIA	film or video
How to Overhaul a Carburetor 421	BERGWALL PRODUCTIONS	film or video
Servicing the Ford Emission Control System Vocational Media Associates 31057-970	PRENTICE-HALL MEDIA	film or video
Troubleshooting Electronic Fuel Injection Vocational Media Associates 09542-970	PRENTICE-HALL MEDIA	film or video
Automotive Emission Control Billy D. Lee and Ronald Ragazzi	OKLAHOMA STATE DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION	module
Engine Tune-Up Service (IE 012 SS 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module

Auto Engine Performance	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Auto Fuel Systems James Duffy and Howard Smith 623-4	GOODHEART-WILLCOX COMPANY, INC.	text
Auto Fuel Systems - Workbook James Duffy and Howard Smith 624-2	GOODHEART-WILLCOX COMPANY, INC.	text
Automotive Diagnosis and Tune Up Johnson	McGRAW HILL BOOK COMPANY	text
Automotive Emission Control Crouse and Anglin	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text
Automotive Tune Up Crouse and Anglin	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text
Basic Engine Ignition Systems	FORD MOTOR CORPORATION, GENERAL OFFICE	text
Chrysler Computerized Engine Controls	MITCHELL INFORMATION SERVICES, INC.	text
Computer Command Control 1981 System Diagnostics 266	EDU-TECH. PUBLICATIONS COMMERCIAL SERVICE COMPANY	text
Computer Command Control 1982 Carburetor Diagnostics 494	EDU-TECH. PUBLICATIONS COMMERCIAL SERVICE COMPANY	text
Computer Command Control 1983 Carburetor Diagnostics 495	EDU-TECH. PUBLICATIONS COMMERCIAL SERVICE COMPANY	text
Computer Command Control Driveability 16016.09-1	GENERAL MOTORS CORPORATION	text

Computer Command Control Fundamentals 16016.05-1	GENERAL MOTORS CORPORATION	text
Computer Command Control Performance Diagnosis 16016.06-4	GENERAL MOTORS CORPORATION	text
Driveability Test Procedure	CHRYSLER CORPORATION	text
Driveability Test Procedure 2 2L Electronic Fuel Injection	CHRYSLER CORPORATION	text
Electronic Engine Controls (EEC IV)	FORD MOTOR CORPORATION, GENERAL OFFICE	text
Electronic Fuel Injection 16009.00-2	GENERAL MOTORS CORPORATION	text
Electronic Fuel Injection 1982/1983 TBI Diagnostics 496	EDU-TECH. PUBLICATIONS COMMERCIAL SERVICE COMPANY	text
Electronic Fuel Injection Diagnosis 16009.02-1	GENERAL MOTORS CORPORATION	text
Engines E. Miles Bacon	FLORIDA STATE UNIVERSITY	text
Ford Emission Related System - Car and Truck	FORD MOTOR CORPORATION, GENERAL OFFICE	text
Fuel Injection	GENERAL MOTORS CORPORATION	text
Gasket Installation Manual No. 263-75	FEL-PRO INC.	text
Pocket Catalog on Specialty Hand Tools and Equipment	K-D MANUFACTURING COMPANY	text
Port Fuel Injection 16009.06-1	GENERAL MOTORS CORPORATION	text
The Motor Oil Story Warren Discher MOS-200REV	PENNZOIL PRODUCTS COMPANY	text

Tools and Techniques G M Computerized Controls Owatonna Tool Company	MITCHELL INFORMATION SERVICES, INC.	text
Understanding Automotive Oscilloscope Patterns	SUN ELECTRIC CORPORATION	text
Basic Engine Ignition Systems	FORD MOTOR CORPORATION, GENERAL OFFICE	text & slides
Electronic Engine Control System	FORD MOTOR CORPORATION, GENERAL OFFICE	text & slides
Electronic Fuel Injection	FORD MOTOR CORPORATION, GENERAL OFFICE	text & slides
4 Gas Emission Testers G1006	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video
Alltest Brainmaster Instructional Tape BR1010	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video
Automotive Pollution Control 447	BERGWALL PRODUCTIONS	video
Computer Command Control (CCC) 79-86 C1001	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video
Computer Command Control Carburetor Overhaul Procedures C1002	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video
Digital and Analog Meters D1003	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video
Emission Controls E1008	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video
Ford EEC I, II, III, and IV 78-86 F1007	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video

Infrared Exhaust Analyzer 440	BERGWALL PRODUCTIONS	video
Scope Interpretation Engine Performance Testing S1009	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video
The Operation of The Fuel System 407	BERGWALL PRODUCTIONS	video
The Problems of The Fuel System 408	BERGWALL PRODUCTIONS	video
Throttle Body Adjustment Procedures T1005	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video
Throttle Body Injection (TBI) 80-86 T1004	ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.	video

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Automatic Overdrive Transmission Ford Technician Training	FORD MOTOR CORPORATION, GENERAL OFFICE	film
Automotive Automatic Transmissions Crouse and Anglin	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text
Automotive Power Trains Sheldon Abbott 02-810130-8	BENNETT AND McKNIGHT - GLENCOE PUBLISHING	text
Automotive Transmissions Sheldon Abbott 0-02-810170-7	BENNETT AND McKNIGHT - GLENCOE PUBLISHING	text
Service Manual Chassis, Body Trans Axles	CHRYSLER CORPORATION	text

Automatic Transaxle (ATX) Diagnosis and Overhaul Ford Technician Training	FORD MOTOR CORPORATION, GENERAL OFFICE	video
C V - America Video Tape Offer	DANA AUTOMOTIVE DISTRIBUTION SALES DIVISION	video
Front Wheel Drive Explained 460	BERGWALL PRODUCTIONS	video

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Auto Standard Transmission 413	BERGWALL PRODUCTIONS	film
Automotive STD TRAN 413 and 412 Clutch	BERGWALL PRODUCTIONS	film
Drive Shaft and Universal Joints 429	BERGWALL PRODUCTIONS	film
Front Wheel Drive Trans-axle Overhaul 463	BERGWALL PRODUCTIONS	film
Fuel Control Systems Information Index Buick Training Systems	GENERAL MOTORS CORPORATION	film
The Automotive Clutch Assembly 412	BERGWALL PRODUCTIONS	film
The Limited Slip Differential 427, 428, 429	BERGWALL PRODUCTIONS	film
Auto Repair Manual	MOTOR BOOK COMPANY	text
Automotive Manual Transmissions and Power Trains Crouse and Anglin	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text

Automotive Power Train Jay Webster	AMERICAN PUBLISHERS	text
Chilton Service Manual	CHILTON BOOK COMPANY	text
Manual Transmissions Drive Trains Kovac - Creager	SOUTHWESTERN PUBLISHING	text
Power Train System	NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)	text
Rear Axle Diagnosis and Repair (Technician Reference Manual)	FORD MOTOR CORPORATION, GENERAL OFFICE	text
Rear Axle and Drive Line Principles of Operation Course 4001	FORD MOTOR CORPORATION, GENERAL OFFICE	text
Service Manual Front Wheel Service Cars	CHRYSLER CORPORATION	text
Manual Transmission and Transaxle Toyota Service Training Center	TOYOTA	video

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Techniques in Modern Cylinder Head Reconditioning	NEWAY MANUFACTURING	film
The Internal Combustion Engine, Measure, and Overhaul--Foreign and Domestic 405, 409, 410, 420	BERGWALL PRODUCTIONS	film
Auto Engine Performance Technician	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text

Auto Engine Repair Jay Webster	SOUTHWESTERN PUBLISHING	text
Auto Mechanics Jay Webster	BENNETT AND McKNIGHT - GLENCOE PUBLISHING	text
Auto Mechanics Heartbeat E. Ellinger	PRENTICE-HALL, Division of Simon & Schuster	text
Auto Mechanics William H. Crouse	McGRAW HILL BOOK COMPANY	text
Auto Mechanics - Workbook Jay Webster	BENNETT AND McKNIGHT - GLENCOE PUBLISHING	text
Automobile Engine Rebuilding and Maintenance Glenn	CHILTON BOOK COMPANY	text
Automotive Engine Repair and Rebuilding Chek-Chart	HARPER & ROW PUBLISHERS	text
Engine Repair Mark House	McKNIGHT PUBLISHING COMPANY	text
Engine and Fuel Manual	NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)	text
Motor Introduction to Auto Engines Charles O. Probst	MOTOR BOOK COMPANY	text
How to Overhaul an Engine 410	BERGWALL PRODUCTIONS	video
How to Use a Valve and Valve Seat Refacer 419	BERGWALL PRODUCTIONS	video
Seals, Adhesives, Sealant	FEL-PRO INC.	video

10.0 DEMONSTRATE PROFICIENCY IN MANAGEMENT SKILLS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Management Guide (IE 010 SS 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module
Automotive Service Business Operation and Management William H. Crouse	GREGG DIVISION, McGRAW-HILL BOOK COMPANY	text

11.0 DEMONSTRATE EMPLOYABILITY SKILLS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Applying for a Job - Instructor's Guide (CE 004 BK 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Choosing an Occupation - Instructor's Guide (CE 010 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Employability Skills Leader's Guide: In-service Workshop (CE 205 BK 85)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Good Work - Instructor's Guide (CE 018 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Job Changes - Instructor's Guide (CE 025 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text

Personal Finances - Instructor's Guide (CE 030 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Your Job Search - Instructor's *Guide* (CE 038 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Employability Skills Series (ESS) (CE 001 SS 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module
Applying for a Job - Student Guide (CE 003 BK 79)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Choosing an Occupation - Student Guide (CE 009 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Employability Skills Participant's Guide: In-service Workshop (CE 074 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Good Work - Student Guide (CE 017 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Job Changes - Student Guide (CE 024 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Personal Finances - Student Guide (CE 029 BK 83)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Your Job Search - Student Guide (CE 037 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text

A Guide to Employability Skills Materials (CE 042 BK 85)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Communication Skills For Trade and Industry Kraska, Mississippi State University	SOUTHWESTERN PUBLISHING	text
ESS for Success (CE 150 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Rolling in the Auto Trades 970	BERGWALL PRODUCTIONS	text

PUBLISHERS' ADDRESSES

AC-DELCO DIVISION
400 Renaissance Centre
Detroit, MI 48243-1604
313-567-5000

ADVANCED AUTOMOTIVE TRAINING SERVICES, INC.
Post Office Box 2819
Columbia, MD 21045-0819
301/596-2470

AMERICAN PUBLISHERS
Post Office Box 7125
Madison, WI 53713

AMMCO TOOLS, INC.
Wacker Park
North Chicago, IL 60064-2799
312-689-1111

AUTOMOTIVE TECHNOLOGY TRAINING
Route 140
Sterling, MA 01565
617/422-8080

BEAR AUTOMOTIVE
2855 James Drive
New Berlin, WI 53151
414-786-5212

BENNETT AND McKNIGHT - GLENCOE PUBLISHING
17337 Ventura Boulevard
Encino, CA 91316

BERGWALL PRODUCTIONS
Post Office Box 238
Garden City, NY 11530
800-645-3565

BOBBS-MERRILL COMPANY
866 Third Avenue
New York, NY 10022
212-702-2000

CHEVROLET MOTOR DIVISION
General Motors Corporation
Detroit, MI 48202

CHILTON BOOK COMPANY
Chilton Way
Radnor, PA 19089
215-964-4000

CHRYSLER CORPORATION
26001 Lowrence Avenue
Center Line, MI 48015

COLOR FILM COMPANY VIDEO DIVISION
770 Connecticut Avenue
Norwalk, CT 06854

DANA AUTOMOTIVE DISTRIBUTION SALES DIVISION
Post Office Box 455
Toledo, OH 43692

DELMAR PUBLISHING
2 Computer Drive West
Albany, NY 12212
518-459-1150

EDU-TECH. PUBLICATIONS COMMERCIAL SERVICE
Post Office Box 2499
Anderson, IN 46018
800/428-6427

EVERCO INDUSTRIES
8324 North Skokie Blvd
Skokie, IL 60077
312/677-4600

FEL-PRO, INC.
7450 McCormick Boulevard
Skokie, IL 60076-4075
312-674-7700

FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION
Knott Building
Tallahassee, FL 32399

FLORIDA STATE UNIVERSITY
Tallahassee, FL 32306
904-644-2525

FORD MOTOR CORPORATION
GENERAL OFFICE
Post Office Box 1000
Dearborn, MI 48121

FORD PARTS & SERVICE DIVISION
Ford Motor Corporation
General Office
Post Office Box 1000
Dearborn, MI 48121

GENERAL MOTORS CORPORATION
3044 West Grand Boulevard
Detroit, MI 48202

GOODHEART-WILLCOX COMPANY, INC.
123 West Taft Drive
South Holland, IL 60473
800-323-0440

GRAVES-HUMPHREYS
1948 Franklin Road, Southwest
Post Office Box 13407
Roanoke, VA 13407
800/336-5998

GREGG DIVISION, McGRAW-HILL BOOK CO.
1221 Sixth Avenue
New York, NY 10020
212-843-0550

HARPER & ROW PUBLISHERS
10 East 53rd Street
New York, NY 10022
800-242-7737

HAYDEN BOOK COMPANY
10 Mulholland Drive
Hasbrouck Heights, NJ 07604
201-843-0550

HUNTER ENGINEERING COMPANY
11250 Hunter Drive
Bridgeton, MO 63044

JAEGER CORPORATION
135 Knowles Avenue
Winter Park, FL 32789-3851

K-D MANUFACTURING COMPANY
3575 Hempland Road
Lancaster, PA 17601-1319
717-285-4581

MITCHELL INFORMATION SERVICES, INC
Post Office Box 26260
San Diego, CA 92126-9984

MOTOR BOOK COMPANY
555 West 57th Street
New York, NY 11530-0238

MT. SAN GARINTO COLLEGE
Career Development Corporation
Glendale, CA 91200

McGRAW HILL BOOK COMPANY
1221 Avenue of the Americas
New York, NY 10020
212-512-2000

McKNIGHT PUBLISHING COMPANY
809 West Detweiller
Peoria, IL 61615
800-447-0682

NATIONAL AUTO SERVICE
Post Office Box 10465
San Diego, CA 92110

NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)
2999 Circle 75 Parkway
Atlanta, GA 30339

NEWAY MANUFACTURING
1013 North Shiawassee Street
Corunna, MI 48817
800/248-3889

OKLAHOMA STATE DEPARTMENT OF VOCATIONAL EDUCATION
State Department of Vocational Education
Stillwater, OK 74074

PARKER HANNIFIN CORPORATION
17325 Euclid Avenue
Cleveland, OH 44112
216-531-3000

PENNZOIL PRODUCTS COMPANY
Post Office Box 2967
Houston, TX 77252-2967

PRENTICE-HALL MEDIA
90 South Bedford Road
Mt. Kisco, NY 10549
914-631-8300

PRENTICE-HALL,
Division of Simon & Schuster
Route 9 West
Englewood Cliffs, NJ 07632
201-592-2000

RADIO SHACK
Ft. Worth, TX 76102

RAM PRODUCTS, INC.
150 Ludlow Avenue
North Vale, NJ 07647

SNAP ON TOOLS CORPORATION
2801 80th Street
Kenosha, WI 53141

SOUTHWESTERN PUBLISHING
501 Madison Road
Cincinnati, OH 45227-1427
513-271-8811

SPECIALTY PRODUCTS COMPANY
204 South Bowen Street, Post Office Box 923
Long Mont, CO 80501
800/525-6505

SUN ELECTRIC CORPORATION
One Sun Parkway
Crystal Lake, IL 60014

TEACHING AIDS, INC.
Post Office Box 1798
Costa Mesa, CA 92628-0798

TOYOTA
Post Office Box 2991, Dept. MSs-10
Torrance, CA 90509

TRW REPLACEMENT PARTS DIVISION
8001 East Pleasant Valley Road
Cleveland, OH 44131-5582

U. S. GOVERNMENT PRINTING OFFICE
North Capital & H Streets Northwest
Washington, DC 20002-4202

VOCATIONAL MEDIA ASSOCIATES
Mount Kisco, NY 10549

WAGNER DIVISION
McGRAW-EDISON COMPANY
100 Misty Lane
Parsippany, NJ 07054

FACILITIES

Facility Design Recommendations

Facilities, tools and equipment are essential parts of training programs, and must be designed to meet State program standard requirements and instructional objectives. This section of the Program Guide contains information for setting up classroom and laboratory facilities. Facility design criteria and space requirements are specified in **S.B.E. Section B, Chapter 6A-2.**

TEACHING FACILITIES

The instructional environment should duplicate, as closely as possible, the real-life work environment the student will enter after graduation. The more the school resembles the industrial environment, the easier it will be for the student to make the transition from school to work. Tools, supplies and equipment should conform to local industry standards. The teacher should actively pursue supplemental resources to expose the students to state-of-the-art equipment.

All facilities should include classroom space, as well as space for regular classroom equipment such as audio-visual equipment. Laboratory facilities should be equipped with work stations or workbenches, tables, chairs and special training aids to demonstrate basic principles and theory. They should contain enough tools and equipment to enable several students to work individually on the same learning activity.

UPDATING FACILITIES

To keep pace with technological changes and improvements, facilities must be updated on a continuing basis. When planning facilities, priority must be to provide space which will fulfill changing needs of the instructional program. Buildings should be designed with flexibility to expand in order to accomodate future program changes and to allow for greater ease of facility updating. The program advisory committee should be used to assist

the school in establishing priorities for obtaining facilities, tools and equipment. Careful planning and analysis of current and future needs will lead to the establishment of an effective training environment.

SCHOOL FACILITIES

Automotive Service Technology Classroom/Laboratory Areas

This section of the program guide provides guidelines for Automotive Service Technology (passenger cars and light trucks) program facilities. All vocational programs must meet additional facility requirements specified in **S.B.E. Section B, Chapter 6 A-2.**

Classroom/laboratory areas should include passenger car service stalls and other student work stations. Each work station and service stall should be equipped with special lighting, as necessary. The service stall area should be equipped with oversized entry doors to accommodate movement of several passenger cars and light trucks at the same time.

The width of entry doors for drive in service stalls should be a minimum of 10 feet single and 20 feet double. For drive through buildings, 12 feet single and 24 feet double doors are required. The overhead clearance for passenger cars should be a minimum of 12 feet 6 inches to provide room for lifts. Where lifts are not provided, the minimum overhead clearance for service stalls should be 8 feet 6 inches.

The width of service stalls must be at least 10 feet. This accommodates a passenger car and provides minimum of 2 feet working space at either end. The "ideal" length for a service stall, including a work bench, is 24 feet. A minimum of 16 feet of aisle space should be provided for areas with multiple service stalls. The "ideal" width for aisle space is 22 feet, with one aisle serving two stalls.

Each service stall should have immediate access to compressed air, exhaust ventilating system, water, work bench and waste receptacle. A minimum of one vehicle lift per three stalls should be provided. Lifts must meet all State established safety standards. Special drains are required. An open trench drain with standard grating, catch basin and inlet for flushing is recommended. The drain must be connected to a trap or clarifier to collect all solids.

The laboratory should include electrical outlets providing 110 volts at each work station. Electrical outlets should be permanently mounted to the work station benches. Additional electrical outlets should be installed along the walls and in the center areas of the laboratory. Electrical outlets in center areas should be mounted on posts between the ceiling and work stations or on pull down extension systems. Special electrical wiring may be required to supply power requirements of specialized equipment. Installation of special furnishings for this program must meet all requirements of local building codes.

A detailed description of facility standards can be found in Standards for Vocational Automotive Service Instruction, published by the Motor Vehicle Manufacturers Association of the United States, Inc., 300 New Center Building, Detroit, Michigan.

CLASSROOM/LABORATORY FACILITIES

Space requirements for **new** facility construction for this program are specified in **S.B.E. Rule 6A-2.032** as shown below.

NEW FACILITIES AUTOMOTIVE TECHNOLOGY	
Occupant Design Stations	40
Net Square Feet Per Occupant	
Minimum	56
Normal	59
Maximum	62
Total Net Square Feet	
Minimum	2240
Normal	2360
Maximum	2480

WORK STATION ARRANGEMENT

The arrangement of work stations and specialized equipment depends upon the general layout of the facilities, but careful consideration must be given to convenience to entrances and exits, easy movement among work stations and tool/storage areas. The area should have a counter convenient to work stations. Overall layout of the facility should be planned so that the location of entrances and exits permits a logical flow of work in progress. One of the most critical factors in planning a facility is the arrangement of work stations to obtain a safe, efficient traffic pattern.

ADDITIONAL FACILITY CONSIDERATIONS

Training Stations

Training stations and live work areas must be available in the type and number required to meet program goals and performance objectives.

Instructional Area

A classroom or designated area of the laboratory should be available for lecture, instruction, viewing audio visual materials and other nonshop activities.

Personal Tool/Equipment Storage Area

A secure storage room or area should be provided, with enough shelf space for student supplies/tool boxes and floor space for equipment.

General Storage

Storage areas for tools, parts, supplies and machines must be sufficient to support the activities outlined in the program goals and performance objectives.

Office Space

An area separate from the classroom and laboratory should be available and convenient for use by the instructor(s) as an office.

Maintenance

A regular facilities maintenance program must be implemented to ensure that equipment and facilities are safe and usable to meet instructional needs.

Housekeeping

The classroom, laboratory and support area(s) must be kept clean and orderly.

Ventilation

A fume/dust removal system should be in place and operable. When appropriate, heating and cooling systems should be used to provide sufficient comfort for learning. Ventilation requirements are stated in **S.B.E. Rule 6A-2.066.**

First Aid

A first aid station must be in place, well marked and complete with appropriate supplies.

Support Facilities

Restrooms, clean-up areas and lockers convenient to the shop should be available for students.

Safety

The facilities must meet all Occupational Safety and Health Administration (OSHA) safety standards, where applicable.

Facility Evaluation

The program advisory committee should be asked to conduct an annual evaluation of the facilities to insure the program's continuing capability to meet instructional objectives.

Safety, Maintenance and Liability

SAFETY

S.B.E. Rule 6A-2.097

The Florida State Board of Education establishes rules for the operation of public schools. **Part III, Section B, Chapter 6A-2** of the State Board of Education Rules contains the standards for existing educational facilities. Subsections deal with the entire school facility in regard to such topics as electrical equipment, flammable materials, ventilation, fire safety, storage and illumination. Subsection 6A-2.097 contains safety regulations pertaining to vocational classes.

The statute requires 100 percent protection of every student and teacher participating in laboratory work wherein the type of activities listed in the statute above are conducted. This will include: demonstration by teachers or students, students and teachers present in a room or laboratory when students are engaged in make-up work or project work, and when anyone is using tools for construction or repair work involving the shaping or cutting of any solid materials.

Rules and regulations for an eye protection program should be organized and distributed to teachers, students and school personnel. Safety devices should be worn by those participating in the activity and by those who are observers or who may be in close proximity.

Marking of Hazardous Areas

Floors, walls, posts, stationary objects, machinery and equipment should be properly painted, marked, coded or identified, according to recommended safety practices of OSHA, the school board and industry.

Emergency Procedure For Injuries

The following procedures are recommended in the event of an injury or sudden illness in a student:

- Refer to the red "fire or medical emergency" signs posted in appropriate areas.
- Provide immediate first aid if so qualified.

- Notify appropriate personnel to advise them of the problem. They can also contact emergency trained personnel on campus.
- A conscious person has the right to refuse treatment and/or transportation to a medical facility.
- Advise students that they will be financially responsible for ambulance and emergency care.
- The paramedics will assume patient care upon arrival.
- If emergency transportation is not indicated, the student may spend time at the clinic, be allowed to go home or go to a medical facility.
- Be sure to complete the appropriate student injury form for any and all accidents or sudden illness.

MAINTENANCE

Schools should have the necessary facilities for routine maintenance. Special maintenance requirements for this program concern the hand and power tools and special automotive test equipment. Arrangements must be made to accomplish routine and non-routine maintenance of automotive tools and equipment. Arrangements can be made through the school's shop or an outside agency.

VOCATIONAL TEACHER LIABILITY

Liability of Teacher and School Board

Negligence of vocational education teachers can cause unnecessary injury, and may result in teacher and school district liability. Vocational teachers are recommended to carry personal liability insurance. To reduce the risk of liability and injuries, the following suggestions are provided.

- Follow accepted policies of the school board.
- Do not allow students to use equipment or tools which have not been approved by the administration and Board of Education.

- Establish safety rules and enforce them.
- Do not leave the shop/laboratory while students are working.
- Do not permit non-enrolled students to use the shop/laboratory.
- Do not allow students to use machines or tools for which instruction has not been given.
- Do not approve unsupervised student activities inside or outside the shop/laboratory.
- Prepare accident forms for all accidents.
- Regularly inspect the workplace and equipment for defects or potential hazards and maintain documentation of unserviceable or hazardous items.
- Consider age, maturity, skill and ability of students when providing instruction and supervision.
- Adminster safety tests to students upon completion of the demonstration of a specific machine, tool or process and keep documentation on file in your office.
- Require all students to wear eye protection devices, when appropriate, for laboratory activities.

SUGGESTED EQUIPMENT LIST

General Classroom Equipment

DESCRIPTION

Chalkboard

Bulletin board

Bookcases

Cabinet-storage

Student study stations

Audio-visual equipment as needed

Laboratory Tools and Equipment

These tools and items of equipment are normally used in this program. Equipment items are listed under each outcome, corresponding to the curriculum framework. Consumable supplies should be readily available to assure continuous instruction. Consumable supplies such as solvent, motor oil and fuel are not contained in the equipment list.

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS

DESCRIPTION

Air compressor (air lines and adequate number of extractors & regulators)
Air hose (10 ft. section) quick-release couples
Air hose (25 ft. section) quick-release couples
Bench stools
Bench, work, steel, 3 ft. 6 in. x 7 ft. 0 in., ht. 2 ft. 10-3/8 in., 12-gage steel top, 2-compartment metal base cabinet, 3 shelves

Bushing driver set
Caliper, inside, vernier & dial
Caliper, outside, vernier & dial
Chisel sets, metal, 12 in.
Creepers, flat
Creepers, seat
Cutaway items - engines, subassemblies (Training Aid)
Dresser, grinding wheel
Drill bits, metal, set
Drill press, 15 in.
Drill, air-operated
Drill, electric (1/2 in. - 1/4 in.)
Drive air impact tool, 1/2 in.
Electric lift, portable
Exhaust ventilating system
Eye wash basin
Fan belt tension gage
Feeler gages, 1/2 in. x 2 in. angled .003 in. thru .035 in.
Feeler gages, 3/16 in. x 1-1/2 in. .001 thru .035 in.
Feeler gages, go-no/go .008 in. thru .027 in.
Feeler gages, metric
Fender covers
File set, hand, metal, including round, half round, flat and triangle
Fire blanket & case
Fire extinguishers (as needed)
First-aid kit
Flaring tool
Frame lift, rotary
Frame lift, single post
Frame lift, twin post
Fuel pipe socket set
General-purpose dolly
Hacksaw
Hammer set, ball-peen, heavy, 24 oz. brass
Hammer set, chipping
Hammer set, plastic
Hammer set, rubber mallet
Hammer set, wooden mallet
Headlight adjustment machine
Helicoil sets
Jacks, floor, 2-ton
Jacks, utility, 5-ton
Long taper punch set
Magnetic pickup tool
Micrometer ball attachment
Micrometer depth gage (0-6 in.)
Micrometer sets, inside (2 in.-8 in.)
Micrometer sets, outside (0-6 in.)
Nut driver set
Oil can, pump-type

Oil filter wrenches
Oxyacetylene welder
Parts cleaning tank
Parts manual
Pedestal grinder
Pliers set, adjustable
Pliers set, diagonal (7 1/4 in.)
Pliers set, end-cutter (7 1/4 in.)
Pliers set, gripping (7 1/2 in.)
Pliers set, hose clamp
Pliers set, needle nose
Pliers set, snap ring
Press, hydraulic, 25 ton
Puller set, general purpose
Riveter, pop set
Safety can
Safety glasses (as needed) with sterile storage cabinet
Scraper, 1 1/2 in. wide
Screw extractor set
Screw pitch gage
Screw thread tap sets, standard & metric
Screwdriver set, Phillips offset (1 & 2, 3 & 4)
Screwdriver set, Phillips set
Screwdriver set, flat-blade
Screwdriver set, offset
Screwdriver set, torx
Scribe marker
Shop manual
Shop tool boards, enclosed or open
Socket ratchets, pull handles
Socket sets, 1/4 in. drive
Socket sets, 3/4 in. drive
Socket sets, 3/8 in. (deep sockets & short)
Socket sets, air impact tool socket set, 1/2 in. sq. drive
Socket sets, extensions
Socket sets, metric
Stand set, adjustable, 15 in. to 24 in. (heavy duty)
Steel ruler
Storage rack, 50 shelves
Tail pipe cutter (1-2 1/2 in.)
Tape measure
Thread chaser set
Tire pressure gage
Tire tools, 4-way lug wrench
Tire tools, hand tire gage
Tire tools, power tire changer
Tire tools, tire irons
Tire tools, tire valve stem wrench
Tool set, mechanics, general student use
Toolbox, large, rollaway
Torque wrench, 1/2 in. drive, 0-275 ft/lb

Torque wrench, 1/4 in. drive, 0-150 in/lb
Torque wrench, 3/8 in. drive, 0-100 ft/lb
Tubing bender
Universal dial test indicator set
Vise, mechanic
Waste oil collection equipment
Wire brushes, manual & power
Wrench sets, Allen wrench set, standard & metric
Wrench sets, adjustable
Wrench sets, box-end set
Wrench sets, combination/open-end set
Wrench sets, flare nut set
Wrench sets, metric set
Wrench sets, open-end set
Wrench sets, steel tubing

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS

DESCRIPTION

Alternator tester, bench type
Alternator-starter-battery tester instrument, portable
Analyzer, spark & exhaust gas
Battery charger, slow, maximum capacity three 12-volt or six 6-volt batteries, portable, with meter, 6 ft. power cord, DC cables & jumper cables
Battery tools, battery filler bulb
Battery tools, battery nut pliers
Battery tools, battery post cleaner
Battery tools, battery post puller
Battery tools, hydrometer
Coil tester instrument
Computer tester, scanner, hand held
Drop light
Dwell-tachometer instrument
Electricity/electronics trainer sets (Training Aid)
Electronic scope analyzer
Extension cords
Growler, armature tester
Gun, soldering
Remote starter switch
Spark plug cleaner-tester
Spark plug gap gages, .023 in. thru .080 in. type
Spark plug wire remover
Stroboscope/timing light
Tachometer, remote type
Terminal kit, solderless
Volt/ohm multimeter, analog & digital
Wrench set, ignition

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS

DESCRIPTION

Arbor press
Ball joint knocker, pickle fork
Ball joint press
Bearing removal tools
Brake pedal jack
Coil spring compressor
Four-wheel alignment machine
Front end alignment tool set for all models
MacPherson strut holding fixture
MacPherson strut press, bench type
MacPherson strut service tools
Power steering puller & installer
Pressure lubrication equipment
Rack & pinion tool set
Seal installation tools, wheel
Steering box spanner wrench
Steering wheel puller & locking plate remover set
Suspension height gage
Tie rod knocker, pickle fork
Tie rod sleeve adjusting tools
Tire depth gage
Vise
Wheel balancing machine, computerized
Wheel bearing cup remover/installer tools
Wheel weight pliers

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS

DESCRIPTION

Asbestos dust vacuum system
Brake bleeder wrench
Brake caliper hone
Brake cylinder clamp
Brake cylinder hone
Brake drum lathe
Brake drum micrometer
Brake drum puller set
Brake line bleeder tank & hose
Brake rotor gage
Brake shoe gage

Brake spoons
Brake spring installer, pliers
Caliper piston pliers
Disk brake rotor lathes, off car & on car types
Disk pad spreader
Drag link & shock tool
Dust boot installer
Funnels for filling master cylinder
Stud remover & installer tool

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SERVICES

DESCRIPTION

Air condition line disconnect tool, Ford
Air conditioner recharge station
Air conditioner system training simulator (Training Aid)
Air conditioner valve adapters, high side
Antifreeze tester
Compressor holding tool
Compressor service tool kit for all makes
Drain pan
Fin straightener
Gage set, manifold, portable
Hose sleeve installation tool
Leak detector, electronic, with micropump
Oil dispensing and measuring device
POA valve tool
Quick coupler kit, Ford
Radiator dye test kit
Radiator pressure tester
Refrigerant can tapper
Thermometer, air conditioner system
Thermometer, cooling system (radiator)
Thermostat tester
Vacuum integrating regulator (VIR) suction tube ring tool
Vacuum integrating regulator (VIR) valve core tool
Vacuum pump

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE

DESCRIPTION

Carburetor cleaning equipment
Carburetor electronic component tools

Carburetor fixtures & tools
Compression tester, gas & diesel engines
Diesel timing light and wrench
Engine diagnostic analyzer
Engine fault code detector, hand held, with attachments for appropriate vehicles
Fuel flow meter
Fuel injector cleaning kit
Fuel injector cleaning tank, ultrasonic
Fuel injector fixtures & tools
Fuel injector tester
Fuel pressure gage, gas & diesel
Fuel quality tester
Hand vacuum pump
Infrared & 4-gas analyzer
Manometer
Oil pressure gages
PCV tester
Port fuel injector/EFI pressure test set
Spark plug gap tool
Stethoscope, mechanics
Timing light, magnetic, with probe
Vacuum gage

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE

DESCRIPTION

Axle nut sockets
Constant velocity joint special tools
Converter pressure flushing equipment
Cooling line flushing equipment
Extension housing bushing & seal remover & installer set
Hydraulic pressure gage
Specialized tools for various types of automatic transmissions
Transmission holding jigs for work bench
Transmission jack
Transmission oil drain, under hoist type
Transmission pedestal stand, under hoist type
Transmission pressure tester
Transmission work bench with oil trap
Universal joint press

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES

DESCRIPTION

Axle shaft remover, slide hammer
Axle stands
Bearing separator
Clutch alignment tool set
Dial indicator set, gear lock
Drift pins
Flywheel turner
Front wheel drive subassembly removal fixtures
Hoist, swing arm frame contact
Micrometer, dial type, magnetic base
Pinion flange holding tools
Pinion oil seal installer
Pinion oil seal remover
Slave cylinder hone
Special tools for various makes of manual transmissions and axles
Transmission fixtures

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE

DESCRIPTION

Cam bearing remover/installation tool
Cylinder bore gage
Cylinder hone
Cylinder leakage tester
Electronic mag flux machine
Engine stand
Glass bead cleaning machine
Hot tank for cleaning large parts
Liquid die check equipment
Machinist's straight edge
Micrometers, metric 0 - 25mm, 50 - 75mm, 75 - 100mm
Oil engine pressure pump
Oil sending unit wrench
Piston pin press set
Piston ring compressor
Piston ring expander
Piston ring groove cleaner
Ridge reamer
Small bore gage for valve guides

Telescopic gage
Timing belt wrench
Valve grinding machine, with seat grinder
Valve guide gage set
Valve guide knurling equipment
Valve guide replacement tool
Valve key replacer
Valve spring compressor
Valve spring tester

10.0 DEMONSTRATE PROFICIENCY IN MANAGEMENT SKILLS

DESCRIPTION

NONE

11.0 DEMONSTRATE EMPLOYABILITY SKILLS

DESCRIPTION

NONE

12.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

DESCRIPTION

NONE

PROFESSIONAL DEVELOPMENT

Teacher Technical Updating

Technical updating workshops are scheduled periodically throughout the State, usually in the summer months. Teachers should take advantage of the opportunity to attend the automotive technology technical update workshops when they are held. All instructional staff are encouraged to participate in as many training opportunities as possible.

Teachers should seek opportunities with local companies to maintain currency with industry trends. During periods when school is not in session, teachers are encouraged to make arrangements to return to industry for suitable involvement in their area of expertise.

Membership in professional associations offers vocational educators an enormous range of opportunities for working together to strengthen the field and to develop personal competence and satisfaction in work. The associations have similar goals and activities. They seek excellence in program content by means of joint efforts among members, communications that keep members current, forums for the discussion of issues in the field, useful and stimulating publications and sound professional growth experiences at local, state, regional and national meetings and annual conventions. They are concerned with increasing public understanding and support of the field. Teachers are encouraged to maintain affiliation with professional organizations. A list of professional organizations follows this section of the guide.

Teacher Standards

As a prerequisite to certification, teachers must have the required years of experience in the appropriate technical field as defined in the certification standards. For the Automotive Servicing Technology program, the requirements are six years continuous experience in automotive mechanics. The teacher is then judged qualified to teach upon meeting one of the following criteria: (1) regular or temporary Florida teacher's certificate with appropriate coverage, (2) Approval of local school board consistent with adopted school policy or (3) regular or temporary Florida teacher's certificate with other than appropriate coverage (has met all occupational experience requirements prescribed as a prerequisite to appropriate certification and has been approved by the school board to teach

out-of-field.) Refer to the Curriculum Framework for this program to determine the appropriate occupational specialization coverage required for certification.

Instructional staff must have technical competency and meet all State and local requirements for certification. Instructors should hold current, nationally recognized certification in the subject areas taught, if awarded. Beginning teachers must be enrolled in the State Beginning Teacher Program.

A systematic method of obtaining "substitute" instructors, approved by the school board, should be used to assure instructional continuity. An orientation session for substitutes should be held on a regular basis. The substitute should be a competent instructor in the occupational area and specific competencies taught.

Professional Organizations and Support Services

EDUCATION ORGANIZATIONS

AMERICAN VOCATIONAL ASSOCIATION (AVA)
1410 King Street
Alexandria, VA 22314
800-826-9972

FLORIDA ASSOCIATION FOR TRADE AND INDUSTRIAL EDUCATION, INC. (FATIE)
Florida Department of Education
Industrial Education - Vocational Division
Knott Building
Tallahassee, FL 32399
904-488-0484

FLORIDA VOCATIONAL ASSOCIATION (FVA)
1420 North Paul Russell Road
Tallahassee, FL 32399
904-878-6860

FLORIDA VOCATIONAL INDUSTRIAL CLUBS OF AMERICA (VICA)
Florida Department of Education
Knott Building
Tallahassee, FL 32399
904-488-0484

TRADE ORGANIZATIONS

This list contains trade associations and technical societies. Many offer training programs of some sort, either directly or through their member companies. Specific details should be requested in writing.

AUTOMOTIVE SERVICE ASSOCIATION OF FLORIDA, INC.
2015 Delta Boulevard, Suite 102
Post Office Box 38007
Tallahassee, FL 32315-8007
904-386-4555

AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS (AAMVA)
4200 Wilson Boulevard
Suite 600
Arlington, VA 22203
703-522-4200

AMERICAN AUTOMOBILE ASSOCIATION (AAA)
8111 Gatehouse Road
Falls Church, VA 22047
703-222-6000

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
1430 Broadway
New York, NY 10019
212-354-3300

AMERICAN TRUCKING ASSOCIATIONS, INC. (ATA)
200 Mill Road
Alexandria, VA 22314
703-838-1700

AMERICAN WELDING SOCIETY, INC. (AWS)
550 Northwest LeJeune Road
Post Office Box 351040
Miami, FL 33135
305-443-9353

ASSOCIATION OF DIESEL SPECIALISTS (ADS)
9140 Ward Parkway
Kansas City, MO 64114
816-444-3500

AUTOMATIC TRANSMISSION REBUILDERS ASSOCIATION
2472 Eastman Avenue
Suite 23
Ventura, CA 93003
805-654-1700

AUTOMOTIVE ENGINE REBUILDERS ASSOCIATION (AERA)
330 Lexington Drive
Buffalo Grove, IL 60089
312-541-6550

AUTOMOTIVE EXHAUST SYSTEMS MANUFACTURING COMMITTEE (AESMC)
300 Sylvan Avenue
Englewood Cliffs, NJ 07632
201-569-8500

AUTOMOTIVE FILTER MANUFACTURERS COUNCIL (AFMC)
300 Sylvan Avenue
Englewood Cliffs, NJ 07632
201-569-8500

AUTOMOTIVE INFORMATION COUNCIL (AIC)
29200 Southfield Road
Southfield, MI 48076
313-559-5200

AUTOMOTIVE LIFT INSTITUTE (ALI)
P. O. Box 1187
Columbia, SC 29211
803-252-5646

AUTOMOTIVE PARTS AND ACCESSORIES ASSOCIATION, INC. (APAA)
1500 Massachusetts Avenue Northwest
Suite 5
Washington, DC 20005
202-833-3450

AUTOMOTIVE PARTS REBUILDERS ASSOCIATION, INC. (APRA)
6849 Old Dominion Drive
McLean, VA 22101
703-790-1050

AUTOMOTIVE SERVICE COUNCILS, INC.
188 Industrial Drive, Suite 112
Elmhurst, IL 60126-1608
313-530-2330

AUTOMOTIVE SERVICE INDUSTRY ASSOCIATION (ASIA)
444 North Michigan Avenue
Chicago, IL 60611
312-836-1300

AUTOMOTIVE TRADE ASSOCIATION EXECUTIVES (ATAE)
8400 Westpark Drive
McLean, VA 22102
703-821-7072

AUTOMOTIVE WAREHOUSE
DISTRIBUTORS ASSOCIATION, INC. (AWDA)
9140 Ward Parkway
Kansas City, MO 64114
816-444-3500

BATTERY COUNCIL INTERNATIONAL
111 East Wacker Drive
Chicago, IL 60601
312-644-6610

BRAKE SYSTEM PARTS MANUFACTURERS
COUNCIL (BSPMC)
300 Sylvan Avenue
Englewood Cliffs, NJ 07632
201-569-8500

DIESEL AUTOMOBILE ASSOCIATION (DAA)
Post Office Box 1501 (Membership)
Concord, NH 03301
603-781-2947

EQUIPMENT & TOOL INSTITUTE (ETI)
1545 Waukegan Road
Glenview, IL 60025
312-729-8550

FRICTION MATERIALS STANDARDS INSTITUTE, INC. (FMSI)
E-210, Route 4
Paramus, NJ 07652
201-845-0440

IGNITION MANUFACTURERS INSTITUTE (IMI)
300 Sylvan Avenue
Englewood Cliffs, NJ 07632
201-569-8500

INDEPENDENT BATTERY MANUFACTURERS ASSOCIATION,
INC. (IBMA)
100 Larchwood Drive
Largo, FL 33540
813-586-1408

INTERNATIONAL MOBILE AIR CONDITIONING ASSOCIATION, INC.
3003 LBJ Freeway Suite 219
Dallas, TX 75234
214-484-5750

MOTOR AND EQUIPMENT MANUFACTURERS ASSOCIATION (MEMA)
300 Sylvan Avenue
Englewood Cliffs, NJ 07632
201-569-8500

MOTOR VEHICLE MANUFACTURERS ASSOCIATION OF THE UNITED STATES, INC. (MVMA)
300 New Center Building
Detroit, MI 48202
313-872-4311

NATIONAL ASSOCIATION OF SERVICE MANAGERS (NASM)
60 Revere Drive Suite 500
Northbrook, IL 60062
312-480-9575

NATIONAL AUTOMOBILE DEALERS ASSOCIATION (NADA)
8400 Westpark Drive
McLean, VA 22102-3522
703-821-7000

NATIONAL AUTOMOTIVE PARTS ASSOCIATION (NAPA)
2999 Circle 75 Parkway
Atlanta, GA 30339
404-956-2200

NATIONAL AUTOMOTIVE RADIATOR SERVICE ASSOCIATION
Post Office Box 1307
Lansdale, PA 19446
215-362-5800

SERVICE STATIONS DEALERS OF AMERICA
304 Pennsylvania Avenue Southeast
Washington, D.C. 20003
202-546-6868

AUTOMOTIVE SERVICE EXCELLENCE
1920 Association Drive
Reston, VA 22091-1502
703-648-3838

NATIONAL SAFETY COUNCIL (NSC)
444 North Michigan Avenue
Chicago, IL 60611
312-527-4800

NATIONAL TIRE DEALERS AND
RETREADERS ASSOCIATION, INC. (NTDRA)
1250 Eye Street Northwest
Suite 400
Washington, D.C. 20005-4112
202-789-2300

NATIONAL WHEEL AND RIM ASSOCIATION (NWRA)
4836 Victor Street
Jacksonville, FL 32207
904-737-2900

PAINT, BODY AND EQUIPMENT ASSOCIATION
9140 Ward Parkway
Kansas City, MO 64114
816-444-3500

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proposal # 018358

CAREER MERIT ACHIEVEMENT PLAN (CAREER MAP)

AUTOMOTIVE SERVICE TECHNOLOGY

(IN15.080300)

State of Florida

An affirmative action/equal opportunity employer

DEPARTMENT OF EDUCATION
Betty Castor, Commissioner of Education

DIVISION OF VOCATIONAL, ADULT AND COMMUNITY EDUCATION
Robert S. Howell, Director

DEVELOPED BY:
University of South Florida
Department of Adult and Vocational Education

INDUSTRY-BASED PARTNERSHIP PROGRAMS: The State of Florida is committed to the development of industry-based partnership programs, designed by education and industry to respond to industry's demand for a highly skilled work force.

ACKNOWLEDGEMENTS

PARTNERSHIP WITH INDUSTRY

The following industry representatives are recognized for their valuable contributions to the identification and validation of the automotive service technology competencies reflected in this MAP:

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Mr. Frederick Wooldridge, Florida Power
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THIS MERIT ACHIEVEMENT PLAN RECORDS THE AUTOMOTIVE SERVICE TECHNOLOGY ACHIEVEMENTS OF:

Student's Name _____

Student ID Number _____

Student's Address _____

_____

Initial Instructor _____

School _____

Date Started _____

PRIMARY JOB TITLE(S) FOR AUTOMOTIVE SERVICE TECHNOLOGY

- Automobile Mechanic Supervisors (DOT#620.131-014)
- Automobile Repair Service Estimators (DOT#620.261-018)
- Engine Repair Specialists (DOT#620.261-010)
- Transmission and Rear Axle Specialists (DOT#620.281-062)
- Automotive Electronics Specialists (DOT#828.281-010)

Program completers qualify for the primary job title(s) listed above. Related job titles may be added based on those job titles found in industry and/or the Dictionary of Occupational Titles.

OVERVIEW

This Career MAP includes the competencies required for entry into the field of automotive service technology. Business and industry representatives have recommended that students in this field master these competencies in order to become employable. Local education agencies (LEAs) may adapt these competencies to meet their workforce needs.

PURPOSE OF THE MAP

The purposes of the MAP are: to display the student performance standards (SPS) required by the LEA and to document the level of achievement on student performance standards that the student demonstrates.

HOW TO USE THE MAP

Administrator and Instructor. The administrator and instructor can use Career MAPs in curriculum planning, program updating and improvement and teacher recruitment, selection and updating. If the LEA changes or adds student performance standards, the revised or additional student performance standards should be included in the blank boxes that appear within each intended outcome or at the end of this MAP.

Instructor. The instructor can use Career MAPs to keep track of student progress on student performance standards. By periodically reviewing the ratings on student performance standards, the instructor can identify a student's strengths and weaknesses and, on that basis, identify the skills for which the student needs remedial instruction or advanced training. The MAP can also be useful in student counseling and evaluation.

Co-op Instructor/Employer. The employer who sponsors a co-op program should use the Career MAP for keeping a record of the student's performance on appropriate standards. The MAPs will also help the co-op instructor/employer in counseling and evaluating the student.

Student. The student may use the MAP to show potential employers the performance standards he or she has mastered. In order to present a complete record, the student should encourage the instructor/co-op employer to rate his or her level of achievement on all the appropriate student performance standards and to fill in the verification form/cooperative work experience page in the back of this MAP.

Employer. The MAP shows an employer the student performance standards mastered by the student (a prospective employee) and the proficiency level achieved on each student performance standard. This information can help the employer make decisions about hiring, job assignments and job-training needs.

RATING STUDENT PERFORMANCE STANDARDS

Ratings on student performance standards should be based upon business/industrial performance standards. The evaluator observes and evaluates student performance as he or she would in the role of the employer or supervisor.

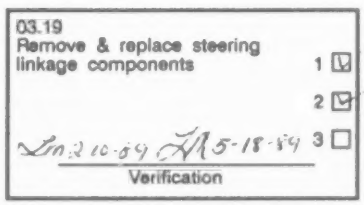
For each skill listed the learner receives a rating of 1, 2 or 3. Each rating indicates a particular level of achievement:

1 = Learner demonstrates knowledge and understanding of this student performance standard, but is not yet able to apply that knowledge or understanding.

2 = Learner performs this student performance standard satisfactorily with only periodic supervision.

3 = Learner performs this student performance standard satisfactorily without supervision.

Whenever a performance standard is demonstrated, the instructor checks the appropriate rating box (1, 2 or 3) and initials and dates the verification line. If the student later demonstrates a higher level of achievement on a performance competency, the instructor crosses out the old level, checks the higher level and then enters his or her initials and the new date on the verification line, as shown in the following example:



NOTE: A student performance standard without a checked rating indicates that the learner has not mastered the standard from lack of either ability, time, opportunity or need (the student's area of specialization may not have required it).

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS.

01.01 Apply shop safety rules & procedures. 1 ☐ 2 ☐ 3 ☐ Verification	01.02 Use & maintain hand tools. 1 ☐ 2 ☐ 3 ☐ Verification	01.03 Demonstrate use of precision measuring tools. 1 ☐ 2 ☐ 3 ☐ Verification
01.04 Use & install fasteners such as screws & bolts, key screw extractors, helicoil inserts & thread cutting taps & dies. 1 ☐ 2 ☐ 3 ☐ Verification	01.05 Use & maintain power tools. 1 ☐ 2 ☐ 3 ☐ Verification	01.06 Apply basic math skills. 1 ☐ 2 ☐ 3 ☐ Verification
01.07 Use & apply metric & English measurement skills. 1 ☐ 2 ☐ 3 ☐ Verification	01.08 Demonstrate an understanding of lubrication requirements. 1 ☐ 2 ☐ 3 ☐ Verification	01.09 Inspect, remove, replace & adjust all belts. 1 ☐ 2 ☐ 3 ☐ Verification
01.10 Perform auto safety inspection. 1 ☐ 2 ☐ 3 ☐ Verification	01.11 Demonstrate use of technical manuals, specification handbooks & charts. 1 ☐ 2 ☐ 3 ☐ Verification	01.12 Demonstrate an understanding of steering geometry & suspension geometry. 1 ☐ 2 ☐ 3 ☐ Verification
01.13 Demonstrate an understanding of the function of steering & suspension system components. 1 ☐ 2 ☐ 3 ☐ Verification	01.14 Demonstrate an understanding of manual & power steering operation. 1 ☐ 2 ☐ 3 ☐ Verification	01.15 Demonstrate an understanding of drum brake operation. 1 ☐ 2 ☐ 3 ☐ Verification
01.16 Demonstrate an understanding of disc brake operation. 1 ☐ 2 ☐ 3 ☐ Verification	01.17 Demonstrate an understanding of brake system valve operation. 1 ☐ 2 ☐ 3 ☐ Verification	01.18 Demonstrate an understanding of basic heating & cooling systems. 1 ☐ 2 ☐ 3 ☐ Verification
01.19 Demonstrate an understanding of basic air conditioning systems. 1 ☐ 2 ☐ 3 ☐ Verification	01.20 Demonstrate knowledge of engine components. 1 ☐ 2 ☐ 3 ☐ Verification	01.21 Demonstrate an understanding of basic ignition & fuel systems. 1 ☐ 2 ☐ 3 ☐ Verification

01.22
Demonstrate an understanding of rear axle operation.
1 ☐
2 ☐
3 ☐
Verification

01.23
Demonstrate an understanding of drive shaft operation, drive shaft construction & universal joint operation.
1 ☐
2 ☐
3 ☐
Verification

01.24
Demonstrate an understanding of automatic transmission operation.
1 ☐
2 ☐
3 ☐
Verification

01.25
Demonstrate an understanding of clutch operation.
1 ☐
2 ☐
3 ☐
Verification

01.26
Demonstrate an understanding of clutch release mechanisms to include linkage & hydraulic.
1 ☐
2 ☐
3 ☐
Verification

01.27
Demonstrate an understanding of manual transmission operation.
1 ☐
2 ☐
3 ☐
Verification

01.28
Demonstrate an understanding of overdrive operation.
1 ☐
2 ☐
3 ☐
Verification

01.29
Demonstrate knowledge of internal engine components.
1 ☐
2 ☐
3 ☐
Verification

01.30
Describe electrical terms, magnetism, electrical current flow & Ohm's law.
1 ☐
2 ☐
3 ☐
Verification

01.31
Demonstrate an understanding of series circuits.
1 ☐
2 ☐
3 ☐
Verification

01.32
Demonstrate an understanding of parallel circuits.
1 ☐
2 ☐
3 ☐
Verification

01.33
Demonstrate an understanding of series-parallel circuits.
1 ☐
2 ☐
3 ☐
Verification

01.34
Apply basic welding skills related to the automobile industry.
1 ☐
2 ☐
3 ☐
Verification

01.35
Demonstrate an understanding of advanced electronics concepts.
1 ☐
2 ☐
3 ☐
Verification

01.36
Demonstrate an understanding of electronic schematic diagrams & diagnostic techniques.
1 ☐
2 ☐
3 ☐
Verification

01.37
Demonstrate an understanding of electrical/electronic wire repair procedures.
1 ☐
2 ☐
3 ☐
Verification

01.38
Demonstrate an understanding of electronic semiconductor concepts & components.
1 ☐
2 ☐
3 ☐
Verification

01.39
Demonstrate an understanding of electronic transistor concepts & components.
1 ☐
2 ☐
3 ☐
Verification

01.40
Demonstrate an understanding of electronic microprocessor concepts, functions & components.
1 ☐
2 ☐
3 ☐
Verification

01.41
Adjust door hinges & striker plates.
1 ☐
2 ☐
3 ☐
Verification

01.42
Locate & correct rattles & noises.
1 ☐
2 ☐
3 ☐
Verification

01.43
Install door moldings.
1 ☐
2 ☐
3 ☐
Verification

01.44
Remove & replace electric window regulators.
1 ☐
2 ☐
3 ☐
Verification

01.45
Adjust electric window regulators.
1 ☐
2 ☐
3 ☐
Verification

01.46 Install air shocks. 1 ☐ 2 ☐ 3 ☐ Verification	01.47 Install C.B.'s & radios. 1 ☐ 2 ☐ 3 ☐ Verification	01.48 Touch up paint. 1 ☐ 2 ☐ 3 ☐ Verification
01.49 Lubricate hinges. 1 ☐ 2 ☐ 3 ☐ Verification	01.50 Adjust headlights [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	01.51 Inspect & replace passenger restraints. 1 ☐ 2 ☐ 3 ☐ Verification
01.52 Check vehicle visibility. 1 ☐ 2 ☐ 3 ☐ Verification	01.53 Check & adjust specified fluid levels. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS.

02.01 Use & apply basic electrical & electronic test equipment & meters. 1 ☐ 2 ☐ 3 ☐ Verification	02.02 Perform power checks with test lights. 1 ☐ 2 ☐ 3 ☐ Verification	02.03 Perform continuity tests. 1 ☐ 2 ☐ 3 ☐ Verification
02.04 Measure voltage drop, current flow & resistance in a circuit or component with a multimeter [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.05 Locate an open circuit & a short circuit. 1 ☐ 2 ☐ 3 ☐ Verification	02.06 Analyze cranking system malfunctions. 1 ☐ 2 ☐ 3 ☐ Verification
02.07 Analyze charging system malfunctions [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.08 Service & test batteries. 1 ☐ 2 ☐ 3 ☐ Verification	02.09 Remove & replace light bulbs [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification

02.10 Test, remove & replace fuses & circuit breakers [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.11 Replace & test starters [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.12 Test & replace alternators. 1 ☐ 2 ☐ 3 ☐ Verification
02.13 Test, remove & replace regulators [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.14 Inspect & repair lighting systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.15 Diagnose, repair or replace turn signal & stoplight switches [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
02.16 Test & replace electrical system switches [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.17 Diagnose, repair or replace power window & power seat systems, including motors. 1 ☐ 2 ☐ 3 ☐ Verification	02.18 Diagnose & service windshield wiper/washer systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
02.19 Test & replace sending units [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.20 Diagnose engine malfunctions. 1 ☐ 2 ☐ 3 ☐ Verification	02.21 Inspect, remove & replace alternator belts. 1 ☐ 2 ☐ 3 ☐ Verification
02.22 Overhaul starters [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.23 Diagnose, repair or replace horn systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.24 Diagnose, repair or replace clock systems. 1 ☐ 2 ☐ 3 ☐ Verification
02.25 Diagnose, repair or replace warning buzzer. 1 ☐ 2 ☐ 3 ☐ Verification	02.26 Test & replace instrument panel units [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.27 Diagnose & service cruise control systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
02.28 Check, remove & replace radios [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	02.29 Test & repair automotive alarm system components [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS.

03.01 Diagnose suspension problems. 1 ☐ 2 ☐ 3 ☐ Verification	03.02 Diagnose wheel/tire vibrations, shimmy & tramp. 1 ☐ 2 ☐ 3 ☐ Verification	03.03 Diagnose steering problems. 1 ☐ 2 ☐ 3 ☐ Verification
03.04 Lubricate suspension, steering gear & linkage [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.05 Check manual steering gear fluid level [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.06 Inspect steering systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
03.07 Inspect suspension systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.08 Inspect & test shock absorbers. 1 ☐ 2 ☐ 3 ☐ Verification	03.09 Check power steering fluid level [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
03.10 Inspect, repair & replace tires & wheels. 1 ☐ 2 ☐ 3 ☐ Verification	03.11 Rotate wheels & tires [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.12 Balance wheels [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
03.13 Service wheel bearings & grease seals on nondrive axles/spindles [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.14 Remove & replace spindles & ball joints [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.15 Remove & replace shock absorbers & mountings [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
03.16 Measure & adjust torsion bar height [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.17 Remove & replace coil springs/torsion bars [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.18 Remove & replace control arms & bushings [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
03.19 Remove & replace steering linkage components. 1 ☐ 2 ☐ 3 ☐ Verification	03.20 Remove & replace steering dampers [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.21 Remove & replace rear suspension parts [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification

03.22 Remove & replace manual/ power steering gear assemblies. 1 ☐ 2 ☐ 3 ☐ Verification	03.23 Check two-wheel alignment. 1 ☐ 2 ☐ 3 ☐ Verification	03.24 Rebuild MacPherson type struts [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
03.25 Overhaul recirculating ball manual gears. 1 ☐ 2 ☐ 3 ☐ Verification	03.26 Rebuild rack-and-pinion manual gears [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	03.27 Remove & replace power steering pumps [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
03.28 Rebuild power steering pumps. 1 ☐ 2 ☐ 3 ☐ Verification	03.29 Overhaul integral steering gears. 1 ☐ 2 ☐ 3 ☐ Verification	03.30 Rebuild rack-and-pinion power steering assembly [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
03.31 Check four-wheel alignment. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS.

04.01 Diagnose brake system problems. 1 ☐ 2 ☐ 3 ☐ Verification	04.02 Diagnose combination valve malfunctions. 1 ☐ 2 ☐ 3 ☐ Verification	04.03 Perform operational inspections. 1 ☐ 2 ☐ 3 ☐ Verification
04.04 Inspect brake assemblies. 1 ☐ 2 ☐ 3 ☐ Verification	04.05 Remove & replace calipers & rotors [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.06 Refinish rotors [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification

04.07 Rebuild calipers [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.08 Refinish brake drums [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.09 Replace drum brake shoes & disc pads [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
04.10 Inspect & replace brake lines & hoses [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.11 Adjust brake shoes [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.12 Adjust parking brakes [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
04.13 Rebuild wheel cylinders [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.14 Remove & replace wheel cylinders [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.15 Bleed hydraulic brakes [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
04.16 Repair or replace parking brake cables & linkage [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.17 Remove & replace master cylinders [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.18 Remove & replace hydraulic power cylinders. 1 ☐ 2 ☐ 3 ☐ Verification
04.19 Flush brake systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.20 Service & repair power assist & brake control systems. 1 ☐ 2 ☐ 3 ☐ Verification	04.21 Service & repair front & rear disc brakes. 1 ☐ 2 ☐ 3 ☐ Verification
04.22 Replace hydraulic brake boosters [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	04.23 Inspect, diagnose & repair anti-locking brake systems. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SERVICES.

05.01 Diagnose overheating problems. 1 ☐ 2 ☐ 3 ☐ Verification	05.02 Check radiator coolant level. 1 ☐ 2 ☐ 3 ☐ Verification	05.03 Test & add coolant [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
05.04 Pressure test cooling systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	05.05 Test radiator caps [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	05.06 Inspect, remove & replace radiator & heater hoses [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
05.07 Remove, test & replace thermostats [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	05.08 Flush cooling systems & replace coolant. 1 ☐ 2 ☐ 3 ☐ Verification	05.09 Remove & replace radiators [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
05.10 Remove & replace water pumps. 1 ☐ 2 ☐ 3 ☐ Verification	05.11 Diagnose basic air conditioning system problems. 1 ☐ 2 ☐ 3 ☐ Verification	05.12 Inspect & pressure test basic air conditioning systems. 1 ☐ 2 ☐ 3 ☐ Verification
05.13 Flush air conditioning systems. 1 ☐ 2 ☐ 3 ☐ Verification	05.14 Discharge, evacuate & charge basic air conditioning systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	05.15 Leak test basic air conditioning systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
05.16 Service air conditioning electrical circuits. 1 ☐ 2 ☐ 3 ☐ Verification	05.17 Service vacuum circuits. 1 ☐ 2 ☐ 3 ☐ Verification	05.18 Remove & replace components in basic air conditioning systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
05.19 Remove & replace engine fan clutches & electric cooling fan & controls. 1 ☐ 2 ☐ 3 ☐ Verification	05.20 Remove & replace blower motors [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	05.21 Remove & replace heater cores, control units & cables [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification

05.22 Diagnose & repair electronic air conditioning controls. 1 ☐ 2 ☐ 3 ☐ Verification	05.23 Remove & replace air conditioning compressor shaft seals. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

06.0 DEMONSTRATE PROFICIENCY IN ENGINE PERFORMANCE SERVICE.

06.01 Analyze engine performance. 1 ☐ 2 ☐ 3 ☐ Verification	06.02 Perform running cylinder balance tests. 1 ☐ 2 ☐ 3 ☐ Verification	06.03 Perform cylinder compression tests. 1 ☐ 2 ☐ 3 ☐ Verification
06.04 Check the performance of engines equipped with on-board computers. 1 ☐ 2 ☐ 3 ☐ Verification	06.05 Inspect, remove & replace points & condensers [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.06 Remove & replace distributor [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
06.07 Check the distributor advance in a vehicle. 1 ☐ 2 ☐ 3 ☐ Verification	06.08 Remove distributor; inspect, test & service. 1 ☐ 2 ☐ 3 ☐ Verification	06.09 Inspect & test primary circuits. 1 ☐ 2 ☐ 3 ☐ Verification
06.10 Remove & replace coils. 1 ☐ 2 ☐ 3 ☐ Verification	06.11 Remove & replace ignition switches & resistors. 1 ☐ 2 ☐ 3 ☐ Verification	06.12 Inspect, remove & replace ignition wires, caps & rotors. 1 ☐ 2 ☐ 3 ☐ Verification
06.13 Remove, gap & replace spark plugs [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.14 Service electronic ignition systems. 1 ☐ 2 ☐ 3 ☐ Verification	06.15 Service air cleaners [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification

06.16 Inspect, remove & replace fuel filters [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.17 Measure fuel flow & pressure. 1 ☐ 2 ☐ 3 ☐ Verification	06.18 Remove & replace fuel lines [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
06.19 Remove & replace fuel pumps [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.20 Adjust idle speed. 1 ☐ 2 ☐ 3 ☐ Verification	06.21 Clean & adjust chokes [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
06.22 Inspect, remove & replace manifold control valves. 1 ☐ 2 ☐ 3 ☐ Verification	06.23 Remove & replace fuel injection system filters. 1 ☐ 2 ☐ 3 ☐ Verification	06.24 Set idle speed to specifications. 1 ☐ 2 ☐ 3 ☐ Verification
06.25 Remove & replace fuel injectors [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.26 Service throttle body fuel injection systems. 1 ☐ 2 ☐ 3 ☐ Verification	06.27 Service ported fuel injection systems. 1 ☐ 2 ☐ 3 ☐ Verification
06.28 Service positive crankcase ventilation (PCV) systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.29 Service evaporative control systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.30 Service thermostatic air cleaners [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
06.31 Service air-injection systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.32 Service exhaust gas recirculation (EGR) systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.33 Inspect, remove & replace catalytic converter [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
06.34 Diagnose mechanical, ignition & fuel emission problems. 1 ☐ 2 ☐ 3 ☐ Verification	06.35 Inspect, remove & replace exhaust system components [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.36 Inspect, remove & replace catalytic converters [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
06.37 Perform cylinder leakage tests. 1 ☐ 2 ☐ 3 ☐ Verification	06.38 Diagnose & correct malfunctions in computer control systems. 1 ☐ 2 ☐ 3 ☐ Verification	06.39 Diagnose, test & replace on-board computer controls. 1 ☐ 2 ☐ 3 ☐ Verification

06.40 Diagnose, service & replace computerized sensors. 1 ☐ 2 ☐ 3 ☐ Verification	06.41 Clean & overhaul electronically controlled carburetor systems [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.42 Remove & replace turbo chargers [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
06.43 Rebuild fuel injection pump [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.44 Check & adjust turbo charger waste gates [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	06.45 Test exhaust emissions using a four gas analyzer. 1 ☐ 2 ☐ 3 ☐ Verification
06.46 Service diesel injectors. 1 ☐ 2 ☐ 3 ☐ Verification	06.47 Remove & replace diesel engine fuel filters. 1 ☐ 2 ☐ 3 ☐ Verification	06.48 Check & adjust injection pump timing. 1 ☐ 2 ☐ 3 ☐ Verification
06.49 Remove & replace injection pumps. 1 ☐ 2 ☐ 3 ☐ Verification	06.50 Check & adjust idle & maximum speeds. 1 ☐ 2 ☐ 3 ☐ Verification	06.51 Test & service preheating systems. 1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE.

07.01 Performance test automatic transmissions. 1 ☐ 2 ☐ 3 ☐ Verification	07.02 Change transmission oil & filter [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	07.03 Adjust linkage from the engine. 1 ☐ 2 ☐ 3 ☐ Verification

07.04 Adjust shift linkage [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	07.05 Adjust neutral safety switches. 1 ☐ 2 ☐ 3 ☐ Verification	07.06 Remove & replace external gaskets & seals. 1 ☐ 2 ☐ 3 ☐ Verification
07.07 Test vacuum shift modulator [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	07.08 Adjust bands [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	07.09 Pressure flush transmission cooler assemblies. 1 ☐ 2 ☐ 3 ☐ Verification
07.10 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock up & shift problems. 1 ☐ 2 ☐ 3 ☐ Verification	07.11 Diagnose, repair & replace trans-axles. 1 ☐ 2 ☐ 3 ☐ Verification	07.12 Pressure test transmissions in vehicles [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
07.13 Test the electrical controls of an automatic clutch converter. 1 ☐ 2 ☐ 3 ☐ Verification	07.14 Service governors. 1 ☐ 2 ☐ 3 ☐ Verification	07.15 Service valve bodies. 1 ☐ 2 ☐ 3 ☐ Verification
07.16 Rebuild transmission assemblies [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	07.17 Rebuild automatic trans-axle. 1 ☐ 2 ☐ 3 ☐ Verification	07.18 Pressure flush converter assemblies. 1 ☐ 2 ☐ 3 ☐ Verification
07.19 Remove & replace extension housings & bushings. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES.

08.01 Diagnose drive line problems. 1 ☐ 2 ☐ 3 ☐ Verification	08.02 Diagnose & performance test manual transmission problems. 1 ☐ 2 ☐ 3 ☐ Verification	08.03 Inspect drive shafts, universal joints & center bearings. 1 ☐ 2 ☐ 3 ☐ Verification
08.04 Lubricate universal joints [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	08.05 Remove & replace transmission mounts [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	08.06 Remove & replace transmissions. 1 ☐ 2 ☐ 3 ☐ Verification
08.07 Adjust shift linkage [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	08.08 Adjust clutches [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	08.09 Remove & replace extension housing seals & bushings [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
08.10 Remove & replace clutches, release bearings, linkage & pilot bearings. 1 ☐ 2 ☐ 3 ☐ Verification	08.11 Rebuild or replace clutch master & slave cylinders [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	08.12 Remove & replace universal joints [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
08.13 Remove & replace speedometer gears & service speedometer cables [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	08.14 Remove & replace drive axle bearings & seals [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	08.15 Service & repair differentials [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
08.16 Remove & replace trans-axle assemblies. 1 ☐ 2 ☐ 3 ☐ Verification	08.17 Adjust trans-axle shifting controls. 1 ☐ 2 ☐ 3 ☐ Verification	08.18 Inspect, remove, replace & lubricate front drive axle flexible joints & boots. 1 ☐ 2 ☐ 3 ☐ Verification
08.19 Inspect, remove & replace constant-velocity universal joints. 1 ☐ 2 ☐ 3 ☐ Verification	08.20 Service manual transmissions to include overdrives [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	08.21 Overhaul trans-axle assemblies [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification

1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE.

09.01 Clean engines [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	09.02 Remove & replace motor mounts. 1 ☐ 2 ☐ 3 ☐ Verification	09.03 Check valve guides for wear. 1 ☐ 2 ☐ 3 ☐ Verification
09.04 Reface valves & seats. 1 ☐ 2 ☐ 3 ☐ Verification	09.05 Perform cylinder balance tests. 1 ☐ 2 ☐ 3 ☐ Verification	09.06 Perform cylinder compression tests. 1 ☐ 2 ☐ 3 ☐ Verification
09.07 Perform cylinder leakage tests [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	09.08 Determine source(s) of oil/ coolant loss. 1 ☐ 2 ☐ 3 ☐ Verification	09.09 Determine source(s) of excess noise [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
09.10 Determine cause(s) of overheating [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	09.11 Check the engine oil pressure. 1 ☐ 2 ☐ 3 ☐ Verification	09.12 Remove & replace core plugs [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification
09.13 Inspect, remove & replace flywheels & ring gears. 1 ☐ 2 ☐ 3 ☐ Verification	09.14 Remove & replace engine assemblies [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification	09.15 Remove & replace oil pans [ASE]. 1 ☐ 2 ☐ 3 ☐ Verification

09.16
Remove & replace oil pumps.
1 ☐
2 ☐
3 ☐
Verification

09.17
Clean cylinder blocks, oil passages & pistons.
1 ☐
2 ☐
3 ☐
Verification

09.18
Inspect blocks for warpage [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.19
Measure & inspect engine components for proper tolerances.
1 ☐
2 ☐
3 ☐
Verification

09.20
Remove & replace crankshafts, mains & rod bearings [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.21
Remove & replace camshafts & bushings [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.22
Remove & replace pistons & rings [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.23
Remove ridges & deglaze cylinder walls.
1 ☐
2 ☐
3 ☐
Verification

09.24
Remove & replace front & rear oil seals.
1 ☐
2 ☐
3 ☐
Verification

09.25
Remove & replace intake & exhaust manifolds [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.26
Remove, clean, inspect & replace cylinder heads; & inspect heads for cracks & warpage [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.27
Test & replace hydraulic lifters.
1 ☐
2 ☐
3 ☐
Verification

09.28
Remove & replace timing chains, belts & gears [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.29
Test valve springs [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.30
Adjust valve lifters [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.31
Replace rocker arm assemblies [ASE].
1 ☐
2 ☐
3 ☐
Verification

09.32
Change oil & oil filters.
1 ☐
2 ☐
3 ☐
Verification

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AUTOMOTIVE SERVICE TECHNOLOGY

10.0 DEMONSTRATE PROFICIENCY IN MANAGEMENT SKILLS.

10.01 Write & process work orders. 1 ☐ 2 ☐ 3 ☐ Verification	10.02 Process parts warranties & labor claims. 1 ☐ 2 ☐ 3 ☐ Verification	10.03 Process merchandise returns. 1 ☐ 2 ☐ 3 ☐ Verification
10.04 Accept & return cores/cards for rebuilt & exchange items. 1 ☐ 2 ☐ 3 ☐ Verification	10.05 Select & care for shop materials. 1 ☐ 2 ☐ 3 ☐ Verification	10.06 Use supervisory techniques for hiring & firing. 1 ☐ 2 ☐ 3 ☐ Verification
10.07 Prepare technical reports. 1 ☐ 2 ☐ 3 ☐ Verification	10.08 Perform business & technical computations. 1 ☐ 2 ☐ 3 ☐ Verification	10.09 Evaluate productivity. 1 ☐ 2 ☐ 3 ☐ Verification
10.10 Develop a customer relations plan. 1 ☐ 2 ☐ 3 ☐ Verification	10.11 Plan service facilities. 1 ☐ 2 ☐ 3 ☐ Verification	10.12 Schedule production. 1 ☐ 2 ☐ 3 ☐ Verification
10.13 Plan, organize, activate & control a service operation. 1 ☐ 2 ☐ 3 ☐ Verification	10.14 Perform auto safety inspections. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

0.0 DEMONSTRATE EMPLOYABILITY SKILLS.

0.01 Conduct a job search. 1 ☐ 2 ☐ 3 ☐ Verification	0.02 Secure information about a job. 1 ☐ 2 ☐ 3 ☐ Verification	0.03 Identify documents that may be required when applying for a job. 1 ☐ 2 ☐ 3 ☐ Verification
0.04 Complete a job application form correctly. 1 ☐ 2 ☐ 3 ☐ Verification	0.05 Demonstrate competence in job interview techniques. 1 ☐ 2 ☐ 3 ☐ Verification	0.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons. 1 ☐ 2 ☐ 3 ☐ Verification
0.07 Identify acceptable work habits. 1 ☐ 2 ☐ 3 ☐ Verification	0.08 Demonstrate knowledge of how to make job changes appropriately. 1 ☐ 2 ☐ 3 ☐ Verification	0.09 Demonstrate acceptable employee health habits. 1 ☐ 2 ☐ 3 ☐ Verification

00.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP.

00.01 Define entrepreneurship. 1 ☐ 2 ☐ 3 ☐ Verification	00.02 Describe the importance of entrepreneurship to the American economy. 1 ☐ 2 ☐ 3 ☐ Verification	00.03 List the advantages & disadvantages of business ownership. 1 ☐ 2 ☐ 3 ☐ Verification
00.04 Identify the risks involved in ownership of a business. 1 ☐ 2 ☐ 3 ☐ Verification	00.05 Identify the necessary personal characteristics of a successful entrepreneur. 1 ☐ 2 ☐ 3 ☐ Verification	00.06 Identify the business skills needed to operate a small business efficiently & effectively. 1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

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P.O.W.E.R. SKILLS (PRINCIPLES OF WORK ENVIRONMENT READINESS)

000.0 COOPERATIVE WORK EXPERIENCE COMPETENCIES.

1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

VERIFICATION

The instructor should verify the level of mastery achieved by the student by initialing the competency box each time the student masters a competency. Later, if the student achieves a higher degree of mastery of a competency, the higher degree should be recorded and verified by the instructor.

INSTRUCTOR SHOULD SIGN FULL NAME AND SCHOOL NAME AND ADDRESS IN THE SPACE BELOW.

Verification	Signature
	Title
	School Name
	School Address

Verification	Signature
	Title
	School Name
	School Address

Verification	Signature
	Title
	School Name
	School Address

COOPERATIVE WORK EXPERIENCE

In addition to classroom training and laboratory performance identified on the Career MAP, this student has participated in cooperative work experience with employers as shown below:

Dates _____ Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

Dates _____ Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

Dates _____ Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

NOTES

This section of the MAP is provided so the instructor, employer, or student may list additional qualifying statements or other pertinent information. All comments should be initialed for verification.